

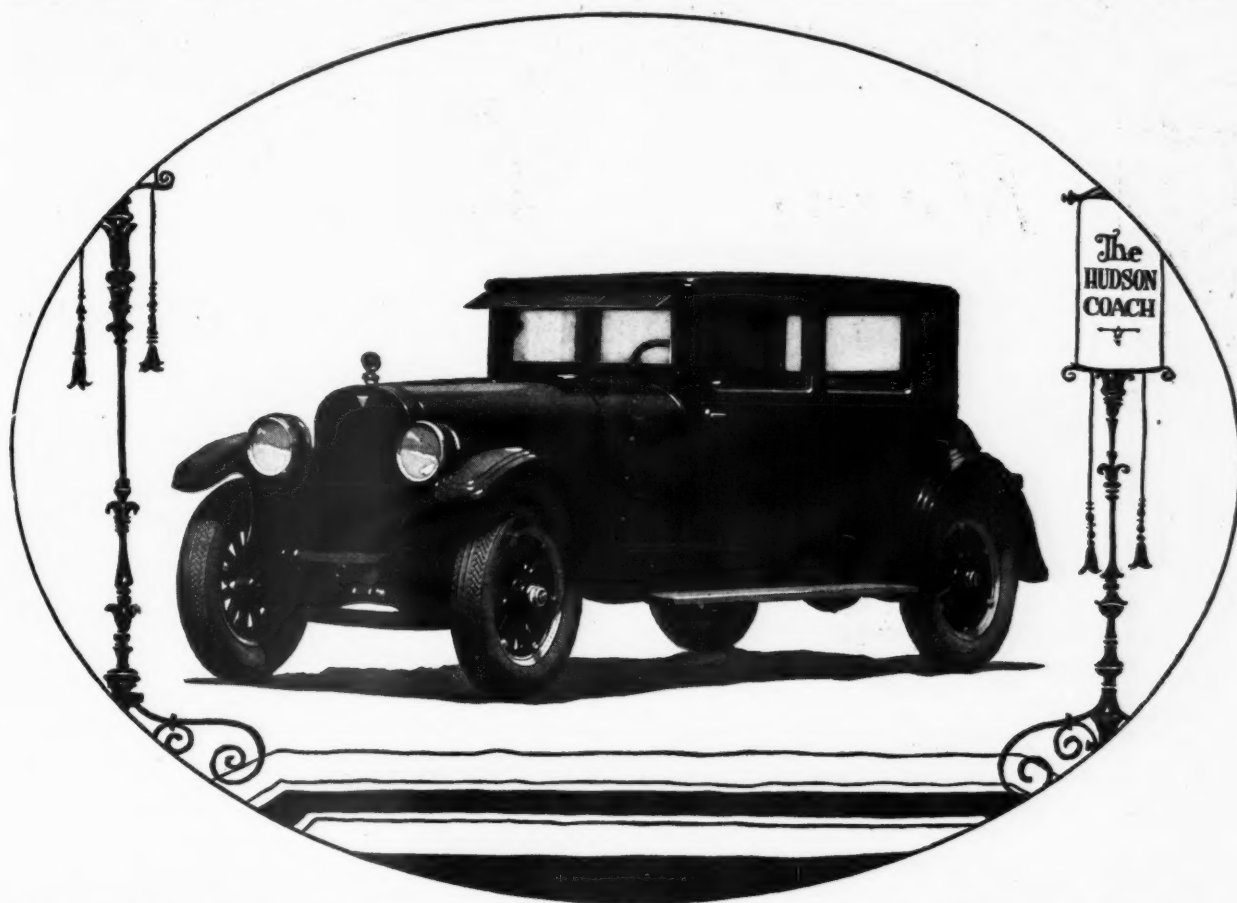
In This Issue—A Department Store for Automobiles

MOTOR AGE

Vol. XLVII
Number 7

PUBLISHED WEEKLY AT 5 SOUTH WABASH AVENUE
CHICAGO, FEBRUARY 12, 1925

Thirty-five Cents a Copy
Three Dollars a Year



World's Largest Selling 6-Cylinder Closed Cars

ESSEX

COACH

\$895

HUDSON

COACH

\$1345

SEDAN

5 Pass.
\$1795

7 Pass.
\$1895

Freight and Tax Extra

Make Money Selling Them

Largest production and sales in Hudson-Essex history opens big new opportunities for dealers.

Hudson and Essex dealers are prosperous. Everyone in the trade knows that. The line affords unequaled advantages. Small line of cars to stock—four Hudson and two Essex—all fast sellers, which means fast turning capital. With the Coach, Hudson-Essex dealers offer a value not equaled within hundreds of dollars of the price. Small service cost, big demand and clean deals make Hudson-Essex dealers successful everywhere. Hudson-Essex dealers have never had a bad year. Now they unquestionably sell the most wanted 6-cylinder cars in the world. You can share these profits. Write today.

Most Outstanding Dealer Opportunity in Motordom

HUDSON MOTOR CAR COMPANY, DETROIT, MICHIGAN



New!

—Water Pump Packing Nut Wrenches

Made of Chrome-Vanadium

Here at last is the first complete line of Water Pump Packing Nut Wrenches.

This type of wrench requires a very wide but thin jaw and a short handle. It cannot be made of ordinary carbon steel and have the strength required.

Heat treated drop forgings of that super alloy steel *Chrome - Vanadium* have made possible the one thin but strong wrench for this special purpose.

A Bonney **CV** Water Pump Packing Nut Wrench fits perfectly, with a positive grip. It has a 30 deg. angle opening and a short handle to allow clearance in a narrow space.

There is a size to fit practically every make of car.

Every garage and repairshop can save time and damage by owning a complete set of these special wrenches.



Bonney
Chrome-Vanadium
Service Tools

Bonney **CV** Special Service Wrenches are made in many models and sizes to cover a big range of shop requirements both regular and unusual. Write for our catalog No. 24 for particulars and prices.

Try These Three Popular Sizes

No. 1240 fits Studebaker Light Six, Jewett, Oldsmobile, Packard 8, trade price \$1.35.
No. 1242 fits Chevrolet, Dodge, Paige 6-55, Jordan, Columbia Light 6, Anderson 41, Auburn 6-43, Davis 71, Elcar 6-50, Westcott 48, trade price \$1.65.
No. 1246 fits Chandler, Anderson 50, Case, Columbia Big 6, Davis 81, Elcar 6-60, Moon, Paige 6-66, Westcott 44, trade price \$1.65.
Write for catalog No. 24 which illustrates and describes the complete line of Bonney Water Pump and other special type wrenches.

Made in U. S. A. by

BONNEY FORGE & TOOL WORKS
Allentown, Pa.

*Also makers of *CV* Engineer and Tappet Wrenches, Carbon Steel Drop-forged Wrenches, Stillson Wrenches, Vises, Pliers and Drop-forgings.*

BONNEY
Chrome **CV** *Vanadium*
WRENCHES

CV is a Bonney Trade Mark registered in the U. S. Pat. Office.

Start this year Right with the Right Merchandising Plan

These are new days, new methods in the merchandising of automobiles.

You must adopt the right merchandising plan if you want to stay in business and make money.

Automobile dealers, as a class, make less than almost any other kind of merchant. The chief reason is they have to buy and sell too many old cars—and don't get enough discount.

Moon dealers *do* make money. The record of the Moon Company last year proves it. And the reason this record was made is an honest piece of merchandise, honestly priced and sold

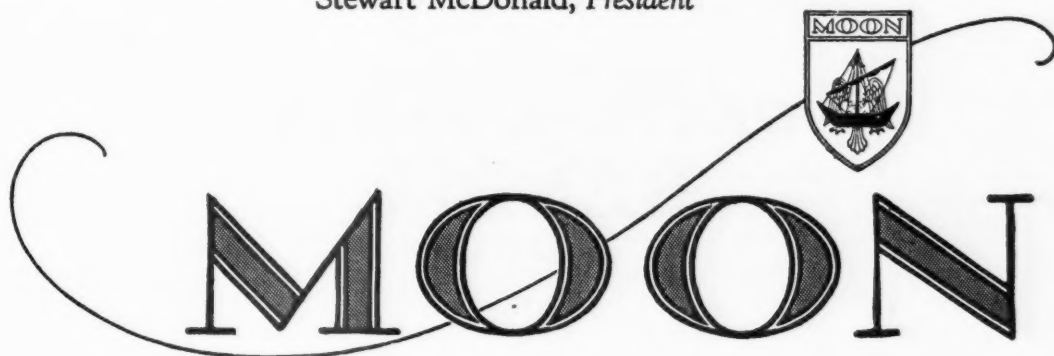
on a new merchandising plan that makes it easy for the dealer to finance his business and get what is coming to him.

If you are a dealer of known experience and good character, Moon will put a carload of cars on your floor at a small down payment. You pay the balance, *when you sell the cars*. You reserve the greater part of your capital to run your business.

If you are interested, write for the booklet, "Are you selling on a 1925 basis." Find out why Moon dealers made more money in 1924 than they did in 1923 and why Moon cars can make more money for you in 1925.

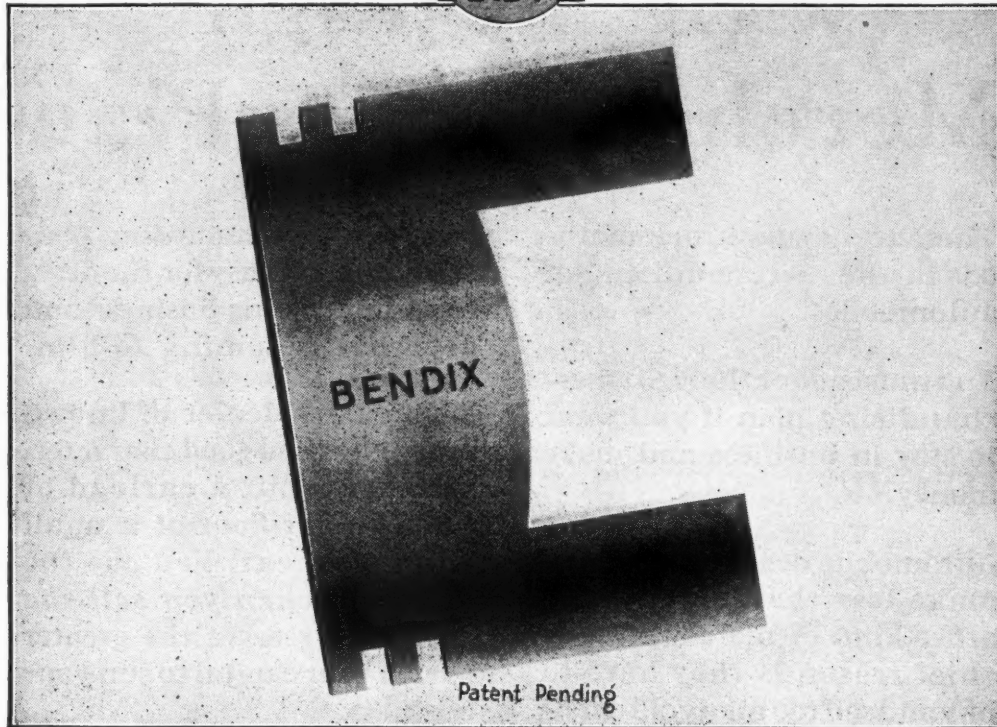
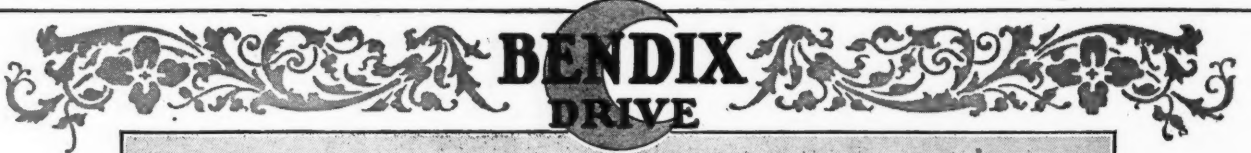
MOON MOTOR CAR COMPANY

Stewart McDonald, President



ECLIPSE

FINE WORKMANSHIP DEPENDABLE QUALITY



CAUTION: In our Bendix Drive advertisements, appearing regularly each month in The Saturday Evening Post and The Literary Digest, the public is being cautioned to buy none but genuine parts and to look for the name "Bendix" on each part.

No Special Tools Needed

A hammer and a blunt chisel are the only tools required to install a genuine Service Sleeve on the Eclipse Bendix Drive. Three sizes service all models.

It pays to sell none but
GENUINE PARTS
 FOR
BENDIX
DRIVE



ECLIPSE MACHINE COMPANY, ELMIRA, N. Y.

ECLIPSE MACHINE COMPANY, Ltd., WALKERVILLE, ONTARIO

MOTOR AGE

Reg. U. S. Pat. Office

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No. 7

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"WITH the excellent product your company is building coupled up with the exceptional advertising campaign and dealers' helps for moving the merchandise, we believe that the Goodrich line is the most profitable for any dealer to handle."

HIGHWAY AUTO
COMPANY

Miles City, Montana

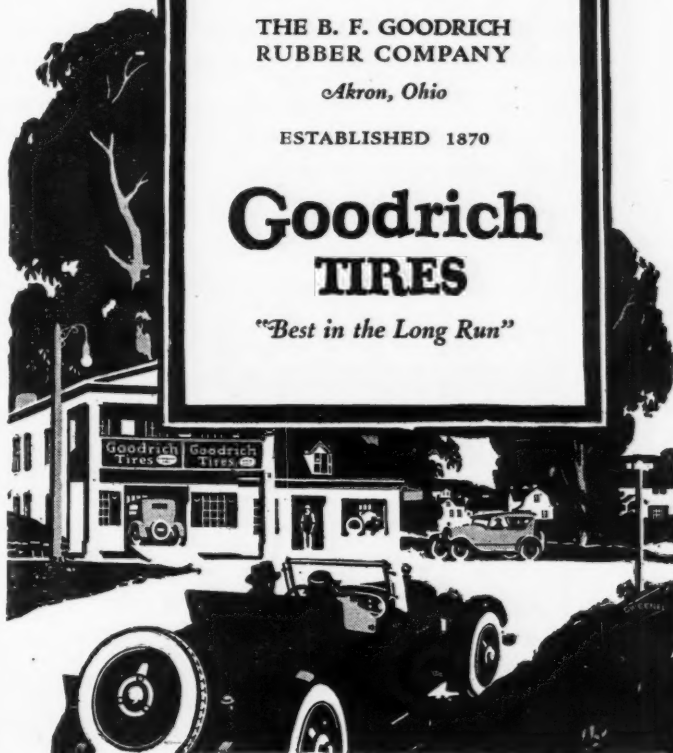
BUILD WITH GOODRICH
for PERMANENCYTHE B. F. GOODRICH
RUBBER COMPANY

Akron, Ohio

ESTABLISHED 1870

Goodrich
TIRES

"Best in the Long Run"



-and then- a lifetime of regret-

He didn't see the danger in time to avoid it. That's no excuse. He did have time—plenty of it—in advance to prepare for just such an emergency by equipping his car with a *Stromberg Electrically Driven Windshield Wiper*.

An absolute essential to safe driving. Operates continually from storage battery—whether engine is running or stopped. Does not run down battery. Doesn't interfere with Carburetion. Easy for you to install.

And you dealers can enjoy a profitable business from its sale. Remind the car owner of the great danger of driving without a *Stromberg Windshield Wiper*. Give him a quick demonstration; it will mean a sure sale. Do your customers a real service—sell them *Stromberg Electrically Driven Windshield Wipers*—make it possible for them to drive in safety. Remember it is the most efficient automotive necessity of its kind on the market. Write for dealers' attractive sales proposition.

Made by the manufacturers of the Famous *Stromberg Carburetors*.

STROMBERG MOTOR DEVICES COMPANY
65 E. 25th Street . . . Chicago

STROMBERG
Electrically Driven
WINDSHIELD WIPER



NEW PRICES

Only the prices have
been reduced—the
quality has not been
changed

19 NEW MODELS

STANDARD SIX

3-Pass. Duplex-Roadster .	\$1125
5-Pass. Duplex-Phaeton .	1145
5-Pass. Coach	1295
3-Pass. Country Club Coupe	1345
5-Pass. Coupe	1445
5-Pass. Brougham	1465
5-Pass. Sedan	1545
5-Pass. Berline	1600

SPECIAL SIX

3-Pass. Duplex-Roadster	\$1450
5-Pass. Duplex-Phaeton	1495
3-Pass. Sport Roadster	1535
5-Pass. Brougham . . .	1795
4-Pass. Victoria	1895
5-Pass. Sedan	1985
5-Pass. Berline	2060

BIG SIX

7-Pass. Duplex-Phaeton	\$1875
5-Pass. Coupe	2450
7-Pass. Sedan	2575
7-Pass. Berline	2650

NOTE: Standard Six—4-wheel brakes, 4 disc wheels \$60 extra
Special Six—4-wheel brakes, 5 disc wheels \$75 extra
Big Six—4-wheel brakes, 5 disc wheels \$75 extra
All prices f. o. b. factory

THE STUDEBAKER CORPORATION OF AMERICA, SOUTH BEND, IND.

STUDEBAKER

THIS IS A STUDEBAKER YEAR

Nash Leads the World in Motor Car Value

Nash Chicago Show Bona Fide Retail Sales Sweep 69% Past Record

When final figures were filed at the close of the Chicago Automobile Show Saturday night, January 31, it was disclosed that the volume of Nash actual retail show sales had mounted 69% beyond the highest previous mark.

Swift as chain-lightning, Nash sales are flashing on and on to new and unprecedented heights.

Scarcely is a record set than it is surpassed.

At the New York Show Nash sales broke the former high record by 41%; Buffalo bettered its top Show figure by 23%; Detroit by 200%; Philadelphia by 108%; Cleveland by 44%; Milwaukee by 125%.

All that we said about 1925 eclipsing 1924 is coming true in a hurry.

NASH

THE NASH MOTORS COMPANY
KENOSHA, WISCONSIN, U. S. A.

Nash Leads the World in Motor Car Value

(1304)



IT takes competition to bring out the best in anything! Perhaps that's why the new Oldsmobile six Coach has been holding the center of the stage at the Auto Shows! With its Fisher body, Duco finish, and Balloon tires, it looks the part of a winner. And it acts like a thoroughbred, too! With an L-Head engine, Delco electrical equipment, and a time-proved chassis—it provides smooth, economical, and long-lasting performance.

The Coach
\$1075

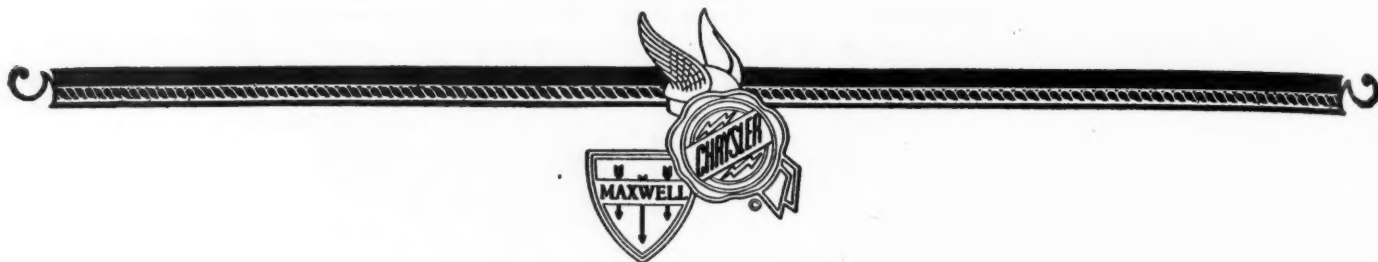
Balloon Tires
f. o. b. Lansing
Tax and Spare Tire Extra

Write us regarding territory

OLDS MOTOR WORKS, LANSING, MICHIGAN

OLDSMOBILE Six

PRODUCT OF GENERAL MOTORS



Coming Events

"Coming events cast their shadow before" is sound philosophy; and wise men, keeping it constantly in mind, make money.

The shadow which Maxwell-Chrysler cast during 1924 was definite and unmistakable. Nor can there be any doubt as to the significance it holds for the future.

The Chrysler Six, for example, received the supreme compliment of a \$50,000,000.00 expenditure on the part of the motoring public for motoring qualities which only it could deliver.

The good Maxwell in its particular field enjoyed a degree of public favor and sincere interest which resulted in a record-breaking volume of sales.

There can be little doubt that this splendid success is but the forerunner of a future success which will be many times greater.

A large number of far-sighted automobile distributors and dealers have already foreseen the tremendous possibilities in the Maxwell-Chrysler franchise.

Write us today and learn how you can profit with the Maxwell-Chrysler—two great cars of unlimited money-making opportunities.

All Maxwell and Chrysler dealers are in position to extend the convenience of time-payments, on a plan that is attractive to the buyer.

MAXWELL MOTOR SALES CORPORATION, DETROIT, MICH.
CHRYSLER MOTOR CORPORATION, DETROIT, MICH.
MAXWELL-CHRYSLER MOTOR CO., OF CANADA, LTD. WINDSOR, ONT.

MAXWELL~CHRYSLER

MOTOR AGE

Vol. XLVII

Chicago, February 12, 1925

No. 7

"Seventh Floor, Center Drive, Right"

In Don Lee's Automotive Department Store in San Francisco the Motorists May Drive to Any Section of Eight-Floor Building to Buy Cars, Accessories, Parts or Maintenance Service

By H. H. DUNN

CAPITALIZING the department store idea and amplifying it to cover all branches of automotive merchandising has proved such a success for a San Francisco automobile distributor that he is now devoting an entire eight-story building to this system. If you are a dealer, and want anything for an automobile, or if you are a motorist, and want anything for your own automobile, from a cotter pin to a new chassis, no matter what the make or model you can drive direct to any of the eight floors in this plant and buy it, or have it put on your car, without stepping out of the automobile to do it.

The application of the department store idea to automotive merchandising, from the whole new car to the smallest part or the cheapest piece of equipment, was made by Don Lee, Cadillac distributor for San Francisco and central and northern California. Mr. Lee sells only Cadillacs, so far as new cars go, but in this store one can buy, or sell, almost any kind of used car in the market, and accessories, parts and equipment for more than a score of the most commonly used cars, other than Cadillacs, for which, of course, full lines are carried.

Scope of Service Rendered

Not only may the motorist or dealer drive throughout the building, having repairs and replacements made and equipment attached, as he goes from floor to floor, but he may have any possible mechanical adjustments made, new tires put on, a new top attached, and his car painted. The building in which this business is done is the largest structure on San Francisco's Automobile Row—Van Ness Avenue—with a frontage of 150 feet on that thoroughfare, and depth of 350 feet, rising seven stories from the Van Ness frontage, and eight from the



Beautiful main salesroom of Don Lee's automotive department store in San Francisco.



Accessory display in Don Lee's automotive department store. The car owner can drive to any part of building and make purchases without getting out of his car.

rear, where is located the main entrance for automobiles.

The main show and salesrooms, filled with new cars, is on the first floor; the used cars, rebuilt, are on the mezzanine, just above the main show and salesrooms.

The prospective buyer, out on an "automotive shopping tour," drives his, or her—for this store is especially designed for the comfort and convenience of the woman motorist—machine into the basement of the building, from the side street, off Van Ness, passing through one side of a set of double doors wide enough to admit and emit two cars abreast on either side. Here, the motorist is met by a courteous, well-informed man who acts in exactly the same capacity as a floorwalker in a regular department store. There is none of the old stuff of a workman in dirty overalls, hammer or wrench in hand, meeting the motorist in this store.

How to Get a New Top

When the automotive "floorwalker" has learned the needs of the motorist, he calls an attendant, also well dressed, a "white-collar" man, and this attendant, stepping into the car, escorts the motorist to the automobile elevators which lift car and passengers to the requisite floor. Assuming that the owner has come for a new top or a paint job, he and his car are taken to the seventh floor, where the machine is backed into a completely-equipped top-building department. On this same floor are the painting, fender and battery departments. Several models of tops, all manufactured by the Don Lee Company for various types of cars, are exhibited in a regular show and salesroom on this floor, where the owner makes his selection. Then his car is run, under its own power, to one corner, where the top is dismantled.

When the old top has been removed, the car is moved to the wood-working shop, on the same floor, where the frame of the new top is built right in to the car. The next step is the making of the top, done entirely by women working in a large room, and cutting the tops to the pattern selected by the customer. This new cover is put on immediately, and, as soon as it is completed, the car is driven to the elevator and carried up to the eighth floor, where the actual work of paint-

ing is done, the sample color room for selection by the customer being on the seventh floor.

If the owner who drives into this department store wishes to buy new parts for his car, he is taken, in his car, from the basement up to the first floor, where, just back of the show and salesroom is located the parts, equipment and accessory

(Continued on page 17)



This seven-story and basement building houses what is probably the most complete automotive department store in the world. It is owned and operated by Don Lee, Cadillac distributor in San Francisco.

Aggressive Program for 1925 Adopted by Iowa Dealers

Campaign for 1000 New Members Will Make Trade Association One of Strongest in Country

(From MOTOR AGE's Special Correspondent)

DES MOINES, Ia., Feb. 8.—In a letter to automobile dealers of the state of Iowa, President Wissler of the Iowa Automotive Merchants Association has outlined the aims of the organization for the present year. By concentrating all effort on the points mentioned in his letter, Mr. Wissler believes the Iowa association will become the strongest and most helpful organization of its kind in the country. The points suggested in the letter follow:

1. Immediately place the association upon a sound financial basis.
2. Conduct a business survey in order to place before the members of this association and manufacturers of cars the true condition of the dealers in the industry in Iowa as the first step to a closer relationship between the manufacturers and dealers, which will mean a more profitable business.
3. Enlarge the association's organization by electing a chairman for each county of the state, 99 of them.
4. Conduct a drive for not less than 1,000 new members. With the association's enlarged organization the success of this drive is absolutely certain.
5. Make plans for a great state-wide meeting to be held soon, announcements of details to be withheld until complete plans are ready.
6. Change the association's fiscal year to the calendar year, and provide a plan for the payment of dues every six months.
7. Conduct a campaign through the columns of the **MOTOR TRADES BULLETIN** to acquaint the automotive industry of Iowa with the insidious work of the "gyp" manufacturers, jobbers and dealers who seek to build up their own nefarious enterprise at the expense of our legitimate automotive merchants.
8. Approve and adopt a legislative program that will, if successfully carried out, greatly benefit the business of every automotive man in the state.
9. In general, make the Iowa Automotive Merchants Association the mouthpiece of the automotive industry of the state.

The I. A. M. A. is committed to the following legislative program. If successful it will again directly serve every garage man, tire, battery, accessory, automobile and truck dealer in that every branch of the automotive industry will enjoy the protection that has been granted to the long established lines of industry.

Legislative Program for the Year

1. The I. A. M. A. will secure, if possible, a monthly graduated basis for computing license fees on motor vehicles. This is not only fair to purchasers but will remove resistance to sales and deliveries during the last month of each quarter.
2. Eliminate, if possible, the \$1 transfer fee now paid by dealers. The I. A. M. A. believes dealers are unduly restricted and taxed as merchants, hence should not be asked to bear this burden, running from a cost of \$10 up to \$100 or \$200 for many and as high as \$800 to \$1,200 for quite a group of the largest dealers.
3. Secure, if possible, a rental battery law similar to that of Pennsylvania. It is brief and gives adequate protection to the battery man, whose losses, state-wide, from lost rental batteries, run very high.

It is the aim of the I. A. M. A. to make the service which it renders to its members of the utmost practical value, and it is believed that the new program will make this possible.

Maintenance Is a Profitable Commodity

No Longer a Nuisance to Be Charged to the Cost of Selling New Cars, But a Definite Source of Revenue for the Progressive Dealer

There was a time when the maintenance or service department of the automobile dealer's establishment was considered merely as something that was necessary to help make sales of new cars. Then the money lost on the service department was distinctly an item to be charged against the cost of selling. Today the situation is different. The progressive dealer operates his maintenance department for the purpose of making a profit, but he gives the customer better service. Still there remains a certain amount of service which is properly chargeable to the cost of making new car sales. This article sets forth some of the fundamental principles necessary for the operation of a profitable maintenance department.

THE service manager drove around the block two or three times with the car the owner was kicking about, then back to the service entrance and honked his horn. As the door swung wide he drove in and jumped out to argue with the man who had done the work. The grease monkey shot a brown geyser into an already filthy corner and said, "Whatjer find?"

"Loose floor boards, that's what," said the manager. "When you worked on the transmission and put back the floor boards you forgot to put in the screws, that's what. No wonder the bus is noisy when the engine vibrates a bit."

The grease monkey gave the manager a hard look. "Say," he drawled, "I'll bet yer ten bucks there weren't no screws in them boards when the car came in."

He won the argument and got away with his alibi. No reflection on him, but a black eye for the concern and its service manager.

Opportunity for Profit

In darkest Russia there was once a man known as General Wrangel who tried to resist the general order of things, imperfect as it was. Today in the maintenance of motor vehicles the general wrangle between the dealer and his mechanic, the dealer and customer and between mechanic and customer is NOT the thing that will make maintenance profitable. At best it is not always pleasant to deal with a man who has had his car break down or acquire the repair shop habit, but the profitable possibilities are there and the well equipped and well manned shops are finding them.

Securing profits from the operation of the shop involves study of those things which let the profits leak away, and one of the greatest of these is idle time in shops where the man is paid by the hour and the dealer collects either by the hour or by the job.

The keystone in the maintenance profits arch is the customer and the job must be profitable to him before it is to any one else. This does not mean a cheap job. It does mean, however, that with the necessary work done on the car, the vehicle can deliver more miles per dollar than would be possible by trading the car in and purchasing a new one, and the margin must be wide, otherwise a new car would be the economical

By A. H. PACKER

PROFITS SERIES

Cost of Selling—No. 5

thing from the customer's standpoint. The time may have been when repairs were made so expensive that the car owner was soon forced to buy another car in self defense, but now there are shops delivering the goods and it is up to the dealer to make his maintenance department meet this up and doing competition.

Satisfaction to the car owner means a quoted fixed price for a definite repair, and in some way the responsibility for a good job must be put on the shoulders of the mechanic, where it properly belongs. If the mechanic is paid an hourly wage, then the come back jobs should be done on his own time. If a flat rate basis is also used for the mechanic then he merely draws nothing for work done over, while on the other hand the mechanic profits if much work comes in and he becomes proficient in doing it. The very fact that some men may take three or four times as long as others in doing the same sort of a job shows the justice of a flat rate charge, both to the customer and the mechanic.

Overhead Is Unavoidable

Even with the mechanic guaranteeing his own work, the shop must take in a certain volume of work in order to make the shop profitable, for a fixed overhead expense for equipment, rent, clerical help and supervision is unavoidable, and this item must be carried regardless of the amount of work brought in.

Even with the precaution taken of guarding against the expense of idle hours, it will be found practically impossible to make much from the sale of labor only, but if the item of parts is considered, the shop should be capable of showing an actual profit, with all overhead expense considered.

Profits from the shop are not likely

unless the shop gains a reputation for good work. This means the customer must be satisfied, which result is one thing to desire and another to get, the reason being that after a large sum has been spent to have cylinders and bearings reconditioned, the engine on the outside looks exactly as it did before. The owner sees the reduction in his bank balance, but is unable to see what he has gained. In buying an accessory the condition is different, for the nickel plating on the spot light or the improved appearance added by the bumper meet a responsive chord in the owner's makeup and recompense him for the expense.

Let Instruments Tell Story

To meet this condition is not easy and yet is necessary and involves a first class contact man with a knowledge of people as well as of cars. To him falls the task of selling car satisfaction rather than thousands of inches removed from cylinder walls or old bearings replaced with new. The idea of greater pep, of smoother running, of greater economy of operation, must be the theme, with the mechanical work merely a means to this end. Then if the customer can be made to visualize his car restored to its original power and hill climbing ability, the battle is won.

It is never easy to tell the owner the extent to which repairs may be needed and whenever possible instruments should be used to tell the story, so that there will be no cause for suspicion. In the case of electrical trouble the voltmeter or ammeter or high rate discharge set usually tell the story, while on mechanical work, the dial indicator and micrometers help corroborate the word of the repairman.

All of these points have to do with building up confidence, without which no maintenance department can operate profitably.

It is a vital mistake to insult the owner by making a derogatory remark about his car, for no matter how much of a junk heap it appears to the casual observer, it is "my car" to your customer. On the other hand a complimentary remark will help smooth the way in preparation for the sad news in regard to the cost of the job. If the paint and cushions have seen better days, drop a remark as to the quietness of the engine.

PROFITS

Next week *MOTOR AGE* will publish the first of a series of five articles on "Turnover of Capital." The first will be on the subject of "The Relation of Profits to Capital."

If the car will not pull, a remark as to the brakes might be in order, while if the whole mechanical condition does not merit a compliment, perhaps a tribute to some accessory will find a warm welcome.

How the Profitable Shops Work It

In seeking profits from the maintenance department, the labor is the bread, the sale of parts, the meat, but the accessories constitute the pie and cake. It is for this reason that shops where profits are made will often be found to have a waiting room where accessory show cases are attractively arranged, and where those waiting on service customers know the accessory line as well as motor car repairing.

The offering of a small percentage to the service salesman is one means of boosting accessory sales, but carries with it the danger that insufficient attention will be given to the customer and his needs and that all the attention will be devoted to trying to sell him something.

One large establishment mentioned such a possibility to their men and then told them it was impossible to let them have a commission because they would

PROFITABLE STONES IN THE MAINTENANCE BUILDING

1. Good work to the last detail.
2. Reduction of idle time.
3. The customer's the boss.
4. Give him his money's worth.
5. Flat rate to the customer.
6. Flat rate to the mechanic.
7. Steady flow of work.
8. Sell better car operation.
9. Use instruments in testing.
10. Build up confidence.
11. Mention car's good points.
12. Never consider owner's car junk.
13. Build up accessory sales.
14. Sales commission to contact men.
15. Accounting that is fair to the shop.

abuse the privilege and neglect their work of keeping the customers satisfied. The men were allowed to think it over for several months, and frequently came to the service superintendent to talk about the project. Finally the plan was put into execution with the provision that

the first complaint in regard to the men on the service floor would result in the elimination of the percentage the men were getting. Needless to say the men have done their best to please customers and have sold accessories as well.

Perhaps inaccurate accounting explains why some shops do not show a profit, and to get a reasonable view of the situation, the shop should be considered as a separate business and the sales department another business. A man selling a car, for example, would not expect a shop up the street somewhere to grease it up for delivery, and yet this is a job that the sales department often hands to the shop without giving the shop credit for the time and supplies used in the work.

Free service within the guarantee period is another item often loaded on the shop which would not be done if the shop were operated by some other company, and charges thus loaded on the shop have the effect of making the shop appear as a drag on the rest of the business. If free service assists in making sales, then the sales department should shoulder the expense as well as benefit by the profits.

Electrical Shop Profits

For years the makers of electrical equipment have supplied wiring diagrams and technical information to those handling electrical service. The commercial side, however, has been somewhat neglected and electrical dealers have been left to sink or swim depending on their own business ability.

A book on the subject of Profitable Electrical Service is now announced by the Automotive Electric Association, this association including many makers of generators, starters, ignition outfits and batteries.

The book is very complete and should be helpful to any electrical service sta-

tion. It discusses relations with the customer and the mechanic, takes up the question of capital, location, building and other factors which have to do with the success of the electrical dealer. It goes into the question of overhead items and bookkeeping and devotes a chapter to advertising, ending up with a chapter on battery mail order competition and another one on dope electrolytes. This book may be obtained from the Automotive Electric Association, Cleveland, Ohio, for 50 cents and is supplied free of charge to those having direct service or sales relations with the manufacturers who are members of the Automotive Electric Association.

Radio Exhibit for Show

AKRON, O., Feb. 9.—An educational radio exhibit will be a feature of Akron's eleventh annual automobile show, to be held at the Central Garage Feb. 21-28, according to Frank O'Neil, manager of the Akron Automobile Dealers Co.

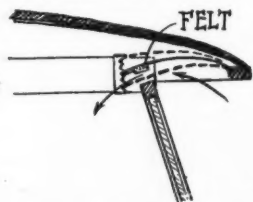
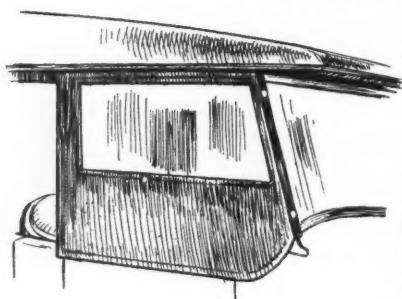
A broadcasting station in the show room will broadcast programs of music and educational talks every afternoon and evening.

Officers in charge of the show company are: W. F. Jones, president; S. L. Savidge, vice-president; J. E. Burns, secretary; Fred E. Johnson, treasurer; J. Grant Hyde, director. More than 200 of the latest products of the automotive industry will be shown.

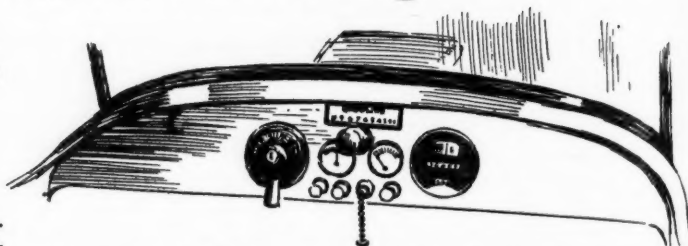


The Moon Motor Car Co., tendered its New York distributors and their dealers a luncheon at the Biltmore, Jan. 7, at which plans for advertising and merchandising the car during 1925 were discussed. Stewart McDonald, president of the company, made a short talk

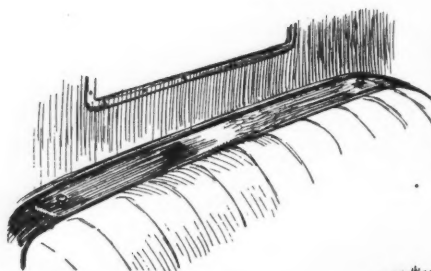
Novel Details in New Car Shown at Chicago



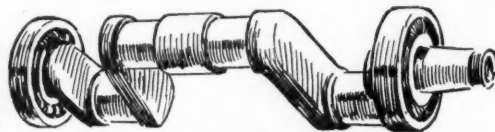
Extension of the permanent top allows installation of an adjustable visor shaped ventilator



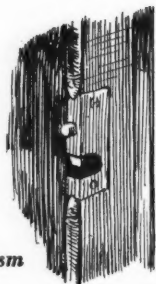
All controls including radiator curtain adjuster are mounted on the instrument board



The curtains are non-folding, have a large transparent area and are stored in the seat compartment



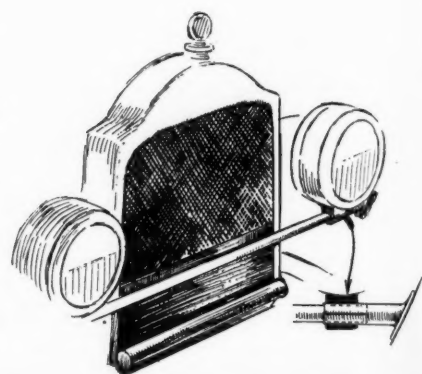
The crankshaft of 2 inches diameter, 17 inches long, is carried on two Fafnir 409A annular ball bearings



A modified gun sear mechanism gives easy door closing



The rear springs are cradle mounted outside the frame rails



The radiator curtain is adjustable from nothing to total obstruction of radiator face area. The combination lamp bracket and fender brace is adjustable and held by the lamp fastening clamp

A car of new design, whose manufacturer's name was not revealed, was exhibited at the Auditorium Hotel in Chicago while the National Automobile Show was in progress. Here are illustrated some of the new features used in its construction.

All-Steel Body Adds Strength Without Weight

IN order to improve the conventional design and construction of automobile bodies the all-steel body has been brought out. A typical example of what has been accomplished up to the present time with this type of body is the Overland all steel sedan. This body is built entirely of steel, without wood framework or joints.

Use Smaller Steel Posts

The all-steel construction permits use of smaller posts of steel between the doors and the windshield corners. This minimizes traffic hazards and insures to the driver a better vision, besides adding to the graceful appearance of the car. It also gives the body greater rigidity, lessens body vibration and eliminates the squeaks and rattles resulting from mortised wood joints, it is stated.

The rigidity of the all-steel sedan has been made possible by improvement in spot and acetylene welding methods. Today, steel, spot welded according to latest shop practice, is so strong that two pieces of metal welded together, under pulling test, have been torn in two, but the welded sections remained intact.

Progress in Body Building

Even progress in the actual formation of the body from sheets of steel has traveled in seven-league boots. When the first motor cars were constructed

bodies were laboriously fashioned by hand, after being sheared from sheets of miscellaneous steel or aluminum. It took an expert hammer man ten hours to shape just one corner of the tonneau. The entire back and two corners were considered three days' work by even the most skillful operators.

Then came the power hammers. These reduced operating costs amazingly. But it was not until the arrival of the huge stamping machines of a later era that totally new production standards were reached, permitting the tremendous reductions in factory costs which caused automobile prices to tumble. Bodies that once took three days to form and build, are now being shaped in titanic presses at the rate of 100 per hour.



All-steel design of body materially reduces the width of posts between doors and windshield corners. This is on the Overland sedan

Possibly No Paris Show in 1925

That an automobile show in Paris is not desirable in 1925, is the opinion of the French Chambre Syndicale des Constructeurs d'Automobiles, an organization corresponding to the American Automobile Chamber of Commerce.

The French show is organized by a joint committee composed of delegates from the various trade associations. This year the Grand Palais, in which the show always has been held, has been turned over to a Government Decorative Arts Exhibition and will not be released until the end of October. The Grand Palais, therefore, cannot become available for an automobile exhibition until November, which would put it on the calendar after the London show. The French manufacturers refuse to take second place, and they have also declined the offer of a new and bigger exhibition hall on the western end of the city.

While the action of Chambre Syndicale in voting against a 1925 show does not remove all possibility of the event being held, it makes the exhibition very doubtful. In certain quarters it is believed that this vote must be looked upon as a demonstration to get the Government to give up the Grand Palais in time for an October show.

Henri Cezanne, show manager, refuses to make a statement.

Kingston Oil Aerator and Filter Tank Put on Market

Purpose of Device Is to Remove Foreign Matter, Including Dirt, Fuel and Water From Oil in Lubricating System of Engine

A NEW device known as the Kingston Oil Aerator and Filter Tank, the purpose of which is to remove foreign matter, including dirt, fuel and water from oil in the lubricating system of the engine, is being marketed by Byrne Kingston & Co. of Kokomo, Ind.

So far as the tank itself and its operating mechanism is concerned, the device is substantially identical with the Kingston Oil-Vac tank, a fuel feeding device, placed on the market about two years ago. The aerator, however, pumps oil and air instead of gasoline and makes use of the inlet manifold vacuum in-

and during the time that the oil spills from the upper to the lower compartment. Furthermore, the heated oil is subjected to sub-atmospheric pressure during the time that it is warm, so that there is an additional tendency to evaporate water and fuel content. All vapor and the air asperated, of course, are drawn into the inlet manifold of the engine and are mixed with the charge entering the cylinders.

Heating of the oil can be done either in a reservoir cast integral with the exhaust pipe or in a separate reservoir with one concave side which can be fastened against the exhaust manifold or exhaust pipe by a suitable U-bolt.

Since the oil flow is intermittent, due to the alternate filling and spilling of the vacuum tank, there are dwell periods during which oil in the reservoir remains for quite a period in contact with the hot walls of the chamber, care being used to place the chamber in such position that it will not drain back into the crankcase when the vacuum is relieved temporarily.

Installation Is Simple

In the lower chamber of the tank is a brass standpipe open at the top end and with a second opening about 2 in. above the tank bottom. Over this pipe fits a spool covered with flannel tube, the ends of which are fastened over the spool flanges. This flannel forms the filtering medium for the oil which can reach the lower opening only by passing through the filter, since the tubular spindle of the spool fits the standpipe closely. Much of the sediment which reaches the lower chamber settles out before the oil passes the filter. If, due to high viscosity, resulting from low temperature or some other cause, the oil cannot pass the filter fast enough, it overflows the top of the standpipe, but still is subjected to the settling action.

Installation of the aerator, even on a car already in service, is a simple matter, since it is designed to be attached to small fittings which replace those forming a part of the original engine. For example, the suction line usually is attached to a Tee which replaces the fitting always used where the conventional vacuum fuel feeding system attaches to the inlet manifold.

Similarly oil usually is drawn from the crankcase of the engine by way of a special plug which is substituted for the ordinary oil drain plug or cock and is returned to the crankcase via the breather, filling spout or a plug or cap-

screw in the timing gear case. All these connections are made with ordinary copper tube fittings, the tube from crankcase drain to top of the float tank passing through the heater. The heater is so proportioned that the temperature of the oil leaving it does not exceed 160 deg. Fahr. in the usual case. The heater can be omitted if desired, as is done in some Ford installations, but in this case a smaller proportion of the fuel content of the oil is removed.



This shows the installation of the Kingston Aerator on a Ford engine

stead of that created by an oil pump as in the Oil-Vac.

Oil, together with some air, is drawn from the bottom of the crankcase of the engine, through copper tubing to an exhaust heated reservoir and thence is delivered into the upper or float chamber of the tank. When the level in this chamber reaches a certain point, the float mechanism opens a valve and spills the oil from the chamber to one below it in which the filter is located. After passing the filter, the oil returns to the crankcase of the engine by gravity.

Oil Heated and Mixed with Air

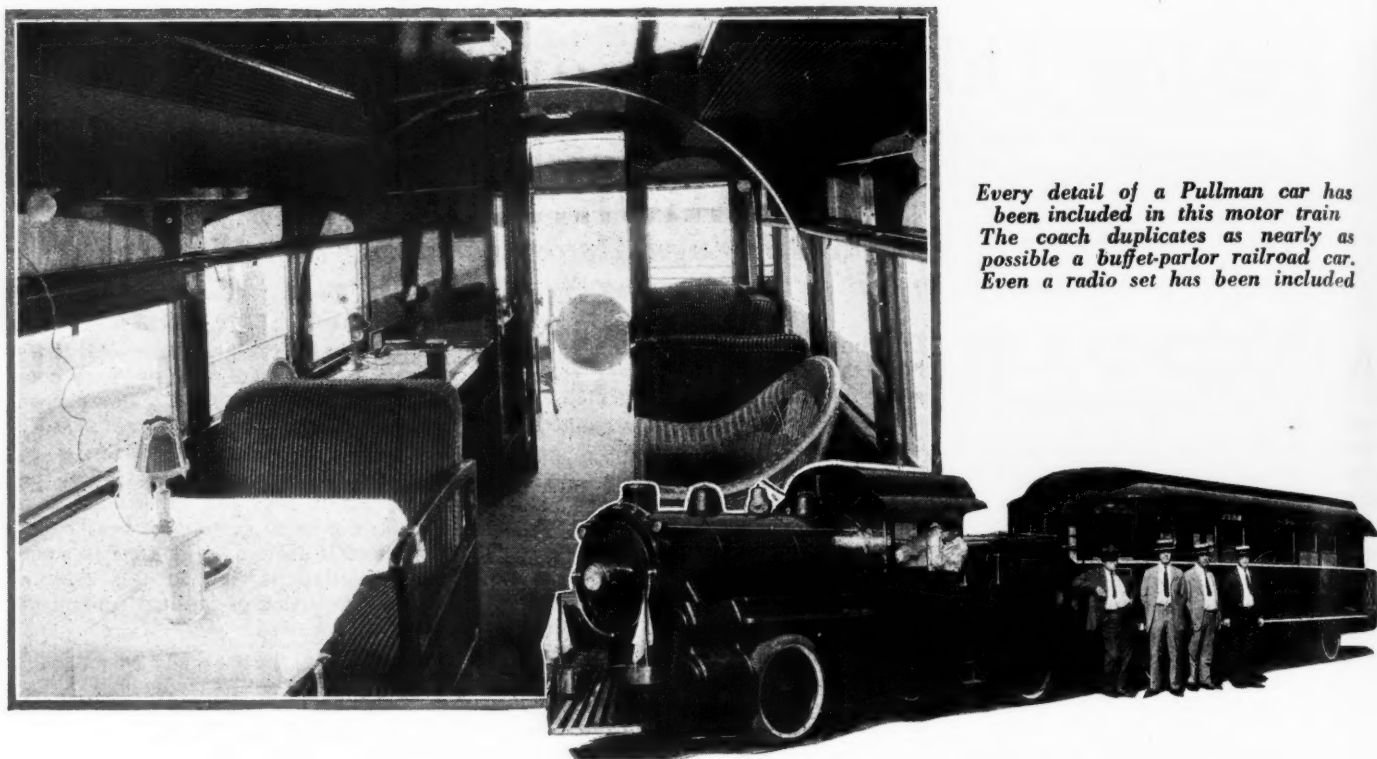
The oil taken from the crankcase is not only heated, but is mixed with air entering through an air bleed when it leaves the crankcase and the air from the lower chamber of the tank is forced to bubble through the oil just prior to



S. R. B. clutch pilot bearing

SRB Clutch Pilot Bearing

In order to overcome the difficulties sometimes encountered in clutch pilot bearings, the Standard Steel and Bearings, Incorporated, Plainville, Connecticut, has designed a new bearing, the outstanding feature of which is a lubricant retainer consisting of a pressed steel disk snapped into a groove in the outer race. This retainer positively and effectively holds a long time supply of grease, it is stated, keeping the bearing properly lubricated and free from dirt. The pressed steel retainer makes possible a simpler and cheaper mounting, eliminating the necessity of a separate seal which does away with extra parts, means less machining and provides greater ease in assembling. In this bearing the steel balls are separated by a riveted stayrod type of ball cage. As many of the clutch pilot bearings depend on the initial greasing for lubrication during the period before the clutch is overhauled, the advantages of this clutch bearing will become apparent.



Every detail of a Pullman car has been included in this motor train. The coach duplicates as nearly as possible a buffet-parlor railroad car. Even a radio set has been included.

Little Brother of the "Century"

But This "Highway Limited," Remarkably Like the Prince of the Rails in Luxury, Is Driven Over Pavements by Gasoline Engines

WHAT is believed to be the first trackless train ever constructed has been completed in Indianapolis by the LykGlas Auto Renewal System, Inc. The train, because of its unusual features, has been named "Highway Limited." It was designed for use in accident prevention work.

Composed of a locomotive and buffet-parlor car, the train is propelled by regulation gasoline motors, but automatic oil burners and pop-off valves produce the effect of a railroad train. Both the locomotive and coach are equipped with separate motors, and may be operated independently, but when coupled, the motor in the locomotive is used to pull the entire train.

The locomotive was constructed some time ago, but has been remodeled to conform in size to the coach, which is entirely new both in construction and design. The engine is 27 feet long and has a boiler four feet in diameter and seven feet long. It is built entirely of steel. The motor is of six cylinders and can develop 90 horsepower.

The real feature of the train is the coach which duplicates as nearly as possible a buffet-parlor railroad car. Shown for the first time at the Indiana state fair, the coach embodies construction arrangements and conveniences never before contained in a gasoline-motored vehicle. Aside from the similarity to a Pullman car, the position and arrangement of the mechanical parts of the car,

with the motor entirely concealed and the steering apparatus in front of the radiator are the features.

Every detail of a Pullman car—observation platform, berths, kitchen, wash room, and even a radio set—has been included, and the windows, ventilating system, trimmings and other parts have been made as nearly as possible the same as in the car. The coach is 28 feet long, 9 feet high from the ground to the top of the crown and 86 inches wide.

Coach Frame Is of Oak

The main frame of the coach is oak. Outside construction of the body is a wood and metal composition, intended to eliminate weight but give sufficient strength. The chassis is bound all around with a steel band with a four-inch flange to protect the car from damage through collision or other accident.

The outside of the car is painted in a two-tone maroon and ivory combination, striped in gold. The entire interior is of mahogany, trimmed in blue velour. In the ceiling of the kitchen and observation platform, there is blue leather.

The front end of the car is used for the drivers compartment and for the kitchen. It contains a cabinet and electric stove. Special design of the motor instruments, gear shift and emergency brake, and brake and clutch pedals have excited considerable comment from those who have viewed the coach. There is a door

in front, but this is opened only when the coach is on display, allowing passage through the entire car.

The observation platform at the rear is 30 inches from the ground and is 6x7 feet in dimensions. A brass rail encloses the platform and safety traps are built over the steps. Entering the car from the platform, a lavatory and wash room are on the right. A folding wash stand is built in with a 10-gallon water tank overhead. On the left side is a daybed and just beyond the wash room a radio set with a concealed inside aerial. Separating the rear section from the center is an ornamental fence partition with an overhead archway. Four regulation parlor car seats are contained, two on each side. Covered in blue velour, the seats are so arranged as to fold back, allowing more room.

There are 16 straight and 4 oval windows in the entire car, and above the two wide windows in the center of each side are half oval windows of tapestry glass. Each window has polished brass sash, with the glass set in rubber channels. The crown on top of the car is one foot high and contains ventilators on both sides. The coach is equipped with a 32-volt direct current lighting system. There are three dome lights inside the car, one on the rear platform, one in the kitchen compartment, eight sidelights, and regular railroad lights on the outside. Underneath the floor of the car are four storage compartments with a large storage capacity for baggage.

All Set For a Big Year



The annual Chicago Studebaker dinner was held at the Blackstone Hotel Jan. 29. H. S. Vance, sales manager of the company, said the key to sales success is to learn the market, move upon it at once and attack it with all the resources available

"Seventh Floor, Center Drive, Right"

(Continued from page 10)

department, the largest single section of the store. Long rows of easily accessible racks stretch the full length of the floor, with trays piled eight tiers in height, the topmost just within comfortable reach of the attendant. There are more than 5,000 parts in these racks for the Cadillac alone, and complete assortments of parts for some 20 other cars. A system of cards and numbers in use here enables the clerks to obtain any desired part in a minimum of time by indicating directly in which tray of which section of which rack it may be found. If the owner wished, he could stand at the counter in this department and order a part to replace every part in any one of the score of cars represented. In fact, with the exception of the wheels and the motor, he could virtually build a Cadillac car right on this floor. At least one duplicate of every one of the thousands of parts in these trays is also kept in storage near this room. A carefully designed card index shows by means of a red tag the depletion of parts in any tray, so that replacements can be made daily if necessary. As a part is sold from any tray, the salesman indicates the number sold on the card in the index file, so that any time, night or day, a glance through this file will show the exact quantity of any part or parts in stock at that moment.

A 24-Hour Establishment

This is a night-and-day, 24-hour, department store, none of the departments, including the service station, ever closes, and the management attributes at least 50 per cent of the new business obtained since this plan was established not long ago, to the fact that the motorist may obtain car, parts, equipment, repairs, accessories, or service at any hour of the night. A party of motorists left San Francisco at 7 p. m., recently, intending to drive through to Los Angeles in the night, when the highway is more free of traffic. Just leaving the outskirts of San Francisco, the machine skidded on a wet strip of pavement, slid off the highway and crashed the rear end into a large tree. One of the rear wheels was dished, the fender and one running board were torn off, the rear axle was bent, and the transmission thrown out of adjustment.

A telephone call brought the wrecking squad from this department store, and, by 8 p. m., the car was in the repair shop on the sixth floor. The necessary parts were assembled

from their department, by midnight the job was finished, and, at 12:30 of the same night, the party was again on its way, with all repairs and replacements completed.

Constant and consistent increase in the amount of automobile repair jobs offered to the night force of this department store has made necessary the increase four times in the night squad of mechanics. In addition to emergency work of all kinds, a great deal of repairing is done for retail salesmen and "drummers," who use their cars constantly during the daylight hours, and save time and money by having their repairs made and their lubrication and adjusting done at night. This all-night repair shop was instituted by Mr. Lee more than a year ago. It occupies all of the sixth floor of the department store, and, in order that the men may work under the best conditions, a special lighting system has been installed.

The fourth and fifth floors of this building are devoted to the washing department and the rental garage. Both of these floors, also, are open all night, with competent men in charge. The two floors accommodate two hundred cars, both being garages, with washing equipment on both, and are filled constantly, this being one of the most remunerative sections of the automotive department store. One of the features of the washing department is the compressed-air room, in which compressed air from several nozzles, placed at convenient intervals, blows the dust and dirt from the car enclosed in the room, while a suction fan in the wall sucks out all this loosened dust and carries it away in a large pipe.

How Idea Originated

The origin of the department store idea as applied to new and used cars, parts and equipment, was in the old parts and accessory department of the Don Lee Company. Here it was found that motorists bought new parts, and more pieces of equipment, if those parts and equipment were so displayed that the owner could look them over at his ease.

The stock of parts and accessories carried amounts to more than \$75,000.

Passing from floor to floor of this new kind of automotive establishment, one is impressed with the adroit manner in which the department store idea is kept before the buying public. All of the things which are for sale are attractively displayed in full view so that they can be examined at the customer's leisure.

New Yellow Cab Truck Sales Plan

Contract for Distribution Through Dealers Has Several New Features

DETAILS of the plan by which the Yellow Cab Manufacturing Co., of Chicago, will distribute its line of trucks through retail automobile dealers have just been announced.

Under this plan dealers who are authorized by contract to sell Yellow Cab trucks will be paid a definite sum for each vehicle sold instead of be remunerated on the usual percentage basis. The amount paid for each sale will vary, depending on the size of vehicle and whether or not it is sold as a chassis only or as a complete vehicle. Payment to the dealer for sales is to be made at the first of each month.

A step toward the elimination of the used vehicle problem is undertaken through a policy of encouraging truck buyers to use their vehicles until they are worn out so that they have no trade-in value except in junk.

With each sale a purchaser's service certificate is given which sets forth specifically the free service and equipment that goes with the new vehicle. The dealer is required to check off on this certificate the performance of each item of service and the delivery of the various items of equipment. For this the dealer will be paid by the manufacturer when he has sent in the purchaser's satisfaction coupon which is a part of the certificate, properly signed by the purchaser.

Dealer Buys Only Demonstrator

The dealer is not asked to fulfill a definite schedule of requirements, but instead needs only to buy demonstrators and then draw upon the nearest factory stock for his customers' requirements. He agrees to display in a conspicuous place on the exterior of his building, a "Yellow Cab Truck" service sign on which he is required to make a small deposit, returnable upon the termination of the contract by mutual agreement. He is supplied with a very comprehensive sales manual and schedule of operating costs that the company was enabled to compile as the result of its 15 years' experience in connection with the country's largest fleet operations.

It is significant to note the co-operation which the Yellow Cab organization is prepared to offer its dealers in its contract. The company, for example, agrees to carry and pay for all the dealer's authorized advertising. Furthermore, a plan has been worked out by which, if the dealer so desires, the manufacturer does all his sales-promotional work.

How this is done is described as follows: If, after the first call has been

Purchaser's service certificate which defines specifically the free service the buyer of a Yellow Cab truck is entitled to receive from the dealer. When the coupon at left is signed by the purchaser the manufacturer pays the dealer for the service rendered

made on the prospect, the dealer thinks wise, he can merely send the name of the man or concern he has solicited to the Yellow Cab Manufacturing Sales Corporation. In its offices in Chicago the organization is prepared to act as sales correspondent for the dealer.

Just as soon as the name of the prospect has been received, a letter goes forward to him on a letterhead bearing the dealer's name and address. This thanks him for the courtesy extended the salesman, expresses the hope that he will think the matter over carefully, and offers to help in aiding him solve his haulage problems. This letter is signed with the dealer's name, per So-and-So. Thus, to all appearances, it is a service the factory renders free of charge.

This first letter is followed up by others, always granting, of course, that the dealer requests this work be taken off his hands. There is nothing in the contract, however, which makes it necessary for the dealer to turn the names of prospects over to the factory sales department. It is entirely optional with him.

ELECTRICAL INFORMATION

Automotive Electrical Information by Bill Fixit is a regular feature of MOTOR AGE every week. Readers of MOTOR AGE have long recognized that Bill Fixit has an inexhaustable supply of the clearest and most authoritative electrical information to be found anywhere. And Bill is ready to answer all kinds of automotive electrical questions for MOTOR AGE subscribers. Read Bill's answers in this issue on pages 26 and 27.

EVERY WEEK in MOTOR AGE

Another and further service the company is prepared to offer its representatives is in its financing arrangement. It will sell them from one to six machines on the basis of 15 per cent of the factory list price, the balance in 90 days. There is no finance charge. Trucks are sent out on a trust receipt and trade acceptance. All time-sales paper is handled without recourse through the Yellow Manufacturing Acceptance Corporation of Chicago, and the dealer is thus relieved on the matter of collections.

Each Part Is Numbered

In the parts book, blueprints are enclosed for every part of a truck body. Each part is numbered so that when a truck is brought into a Yellow Cab Authorized Service Station with a panel or some other part smashed, all the dealer need do is to turn to his parts book, look up that particular part, note the number and get the part from his stock, or in event he fails to have it, send at once to the factory for it.

Your Income Tax

Losses arising from fires, storms, shipwreck "or other casualty," or from theft, whether or not connected with a taxpayer's business, may be deducted from gross income in his 1924 income tax return. If his home or automobile is destroyed by fire or his property damaged by storm, the loss is deductible for the year in which it was incurred.

Loss of property by theft or burglary is an allowable deduction, and need not be incurred in the taxpayer's trade or business.

A loss from embezzlement is also deductible.

All losses are deductible only to the extent which they are not compensated for by insurance or otherwise.

Some Official Packard Flat Rates

Compared With Schedules Published in MOTOR AGE
Flat Rate Chart

THROUGH the courtesy of the Packard Motor Car Co., MOTOR AGE publishes on this page a comparison of the official Packard flat rate prices for certain repair operations with the suggested prices for the same operations given in the MOTOR AGE Flat Rate Chart which was a part of the Oct. 23, 1924, issue of this publication.

In publishing the Flat Rate Chart, which covered 101 operations on 23 makes of cars, MOTOR AGE made it plain that the suggested prices were not in all cases the official or authorized factory rates. Because of lack of uniformity in definition and grouping of operations by factory service departments, it was impossible to compile so extensive a list of operations and find for each a corresponding operation in the official factory schedules.

In the MOTOR AGE compilation, therefore, it was necessary for the editors in many cases to adjust certain operations to an arbitrary standard in order to arrive at a basis for estimating prices.

Another factor which accounts for some variations in the MOTOR AGE chart from official factory schedules is the fact that in some cases factory rates are based on the use of certain specialized equipment by the service station, or a unit exchange plan available only to authorized service stations. Since the MOTOR AGE chart was intended for the guidance of the repair industry in general it was necessary to calculate the suggested schedules on the basis of the average well equipped shop without the privilege of unit exchange. This naturally resulted in the quotation of higher prices for some operations than those suggested for the same operations by the manufacturers. It was the purpose of MOTOR AGE to suggest only prices that could be used to net a reasonable profit by the average well equipped shop.

Company Has Reduced Repair Costs

The Packard Motor Car Co. occupies a leading position among manufacturers who are helping their authorized dealers and service stations to make a reasonable net profit from their shops. It is interesting and instructive, therefore, to note to what extent this company has been able to reduce repair costs through the use of specialized equipment and improved methods, among them being the exchange of factory reconditioned units.

Through the application of flat rates and special service methods the service departments of the Packard factory branches, in the year ending Aug. 31, 1924, contributed 39 per cent of the net profit of \$1,401,109 earned by those branches.

MOTOR AGE No.	Packard Symbol	Condensed Description of Operation. (For full definition see chart in Oct. 23, 1924, MOTOR AGE)	Hrs.	Packard Official Price	MOTOR AGE Chart Price
1	M-661	Install full set piston rings.....	10.5	\$15.75	\$13.50
2	M-631	Install rings one piston only.....	4.8	7.20	6.40
2a	MM-664	Install pistons, head and pan off.....	8.5	12.75	24.00
2b	MM-665	Install one piston or pin.....	1.0	1.50	1.50
3	M-24	Grind valves and tune engine.....	7.2	10.80	12.50
4	M-24	(Less 2 Hrs.) Same as No. 3, head off.....	5.2	7.80	10.25
5	None	Install valve guides, head off.....			13.50
7	M-610	Remove and install cylinder head.....	2.0	3.00	3.00
8	M-59, M-641	(Less 2 Hrs.) Install lower rod bearings.....	14.5	21.75	30.50
9	M-510, M-610	Cylinder head and oil pan off and on.....	4.0	6.00	5.25
10	M-514	Install one rod lower bearing.....	7.0	10.50	8.75
11	MM-514	Same as No. 10, head and pan off.....	3.0	4.50	5.25
12	M-59	Adjust rod lower bearings.....	10.0	15.00	15.75
13	M-59	(Less 4 Hrs.) Same as No. 12, head and pan off.....	6.0	9.00	13.50
14	M-515	(Less 2 Hrs.) Adjust main and rod lower bearings.....	19.0	28.50	33.75
15	M-510	Remove and install oil pan.....	2.0	3.00	3.75
16	M-589	(Less 7 Hrs.) Install lower rod and main bearings.....	47.0	70.50	75.00
19	M-584	Install front main bearing.....	37.0	55.50	52.50
20	M-512	Install rear or center main bearing.....	14.0	21.00	52.50
21	M-97	Clean and reinstall one muffler.....	4.0	6.00	6.00
22	M-635	Renew bearings, pistons, pins, rings.....	42.0	63.00	93.75
23	A-15	Reline and adjust rear brakes.....	13.0	19.50	18.00
24	A-12	Reline and adjust outer rear brakes.....	7.0	10.50	9.75
25	A-112	Reline and adjust inner rear brakes.....	8.0	12.00	15.00
28	A-116	Equalize and adjust all brakes.....	2.2	3.30	4.00
29	A-311	(Less 1 Hr.) Renew brake drum, wheel off.....	2.0	3.00	3.75
31	A-41	Remove and install carrier assembly.....	11.0	16.50	17.00
32	A-41	(Less 1 Hr.) Remove rear axle assembly.....		1.50	1.50
34	A-47	(Less 1 Hr.) Install rear axle assembly.....		1.50	1.50
35	A-411	Overhaul differential assembly.....	12.5	18.75	21.75
37	A-41	Install one axle drive shaft.....	2.0	3.00	3.00
38	A-48	Install ring gear and pinion.....	12.5	18.75	21.75
39	T-36	Install new propeller shaft.....	2.5	3.75	5.25
40	A-410	(Less 5 Hrs.) Remove, dismantle, inspect rear axle.....	5.0	7.50	7.50
42	A-310	Remove, install both rear wheels.....	2.0	3.00	3.00
43	T-120	Overhaul clutch.....	9.0	13.50	20.15
44	T-15	Reline clutch only.....	9.0	13.50	13.50
45	TT-111	Reline clutch removed from car.....	2.0	3.00	3.00
48	T-110	(Less 2 Hrs.) Remove only clutch assembly.....	5.5	8.25	10.50
49	T-110	(Less 3 Hrs.) Install only, clutch assembly.....	3.0	4.50	5.25
52	M-412	Renew front-end chains.....	4.1	6.15	6.40
54	S-245, S-246	Install front-wheel bearings.....	4.0	6.00	6.00
56	M-42	Remove and install chain-case cover.....	4.0	6.00	6.00
57	M-810	Remove and install radiator.....	1.8	2.70	2.25
58	A-38	Overhaul front axle.....	7.0	10.50	18.00
59	A-40	Remove and install one front axle center.....	7.0	10.50	13.50
60	S-111	(Plus 1 Hr.) Rebuild front axle.....	6.0	9.00	13.50
62	S-118	Adjust steering gear.....	.5	.75	.75
64	S-33	Remove and install steering wheel.....	1.0	1.50	1.50
66	S-251	Remove and replace both front wheels.....	2.0	3.00	3.00
67a	M-710	Remove and replace oil pump.....	3.0	4.50	4.25
68	M-31	Clean and adjust carbureter.....	1.5	2.25	3.00
70	L-23	Change lubricant, transmission, differential.....	1.2	1.80	2.25
71	B-61	Tighten all body bolts.....	.9	1.35	1.50
72	M-11	Tune engine.....	2.3	3.45	3.75
74	M-841	Renew all hose connections.....	1.0	1.50	1.50
75	F-420, F-41	Renew fenders, running board and splash shield, on one side.....	8.0	12.00	12.00
76	F-41	Renew one front fender.....	4.0	6.00	6.00
77	F-110	Renew one rear fender.....	2.2	3.30	3.00
78	F-422	Renew one running board.....	3.0	4.50	4.50
79	F-21	Renew one front spring.....	2.0	3.00	3.00
80	F-22	Renew one rear spring.....	2.0	3.00	4.50
81	F-27	Renew shackle and spring bolts, bushings.....	8.2	12.30	21.00
82	M-216	Adjust tappets.....	.6	.90	1.50
83	T-37	Renew one universal joint.....	2.5	3.75	3.75
84-85	MO	Remove and install power plant.....	15.0	22.50	27.00
87	M-636	Regrind overhaul engine.....	40.0	60.00	84.00
89	M-635	Renew block and refit pistons.....	40.0	60.00	84.00
91	M-630	Strip block for regrinding and reinstall.....	7.0	10.50	15.00
92	M-515	Adjust engine bearings, reassemble and fit new gears.....	21.0	31.50	51.00
95	M-547	Renew flywheel.....	15.0	22.50	22.50
97	T-130	Overhaul transmission and clutch.....	10.0	15.00	21.75

Compressed Air Has Varied Application in Automotive Shop

Rapid Cleaning of Parts by Air Big Factor in Flat Rate Operations. Paint Spray Guns Effect Big Saving in Time

By B. M. IKERT

(This is the eleventh of a series of articles dealing with useful shop equipment)

WITH proper equipment and accessories compressed air can be put to an almost endless variety of uses in the maintenance of motor vehicles, both as to chassis and body, but the possibilities of compressed air in the automotive shop and service station have to a large extent been overlooked. Too many have thought of air only for tire inflation work and as a convenience for customers.

As long as the matter of tire inflation is well understood it can be omitted in this article. Even some of the most humble shops at the cross roads boast of their air service and the well-known and often welcome sign "free air" has been a part of motordom for years.

But Recently Used in Service Stations

But now, for some of the other and too often overlooked uses of air in the shop. Air has been used for years in factories of every kind to clean machines of chips, dust, etc., but only of late has there been any attempt made to use it similarly in the garage or service station. It took the fellows who clean your engines and cars while you wait to wake up others to the possibilities of air. Everyone knows that to clean an engine which has been in service for some time is a job if you have to resort to a bucket of kerosene and a brush. But with compressed air and water or kerosene it is easy and the beauty of it is the dirt and grit is removed from the smallest crevices and corners which ordinarily cannot be reached any other way.

When it comes to using air in the service station for cleaning purposes it generally is used with a pressure of about 50 lbs. and the diameter of the orifice should be not greater than 1/32 in. A larger one simply wastes air.

The uses of air for cleaning are many. The stockroom bins and shelves can be blown clean, carbon, after scraping, can be blown from an engine. Oil pipes and fuel lines can be blown clean. Gasoline and other tanks can be dried before soldering them. Air can be used for cleaning upholstery, cleaning small parts, such as anti-friction bearings after they have been immersed in a kerosene bath, etc. Remember too, that after a car has been washed, air can be used for drying such parts as the spokes of a wire wheel, etc. This saves much time and does an excellent job.

The market affords quite a range of

air-driven tools which readily find a place in the automotive shop, especially where electric current is not available. The cost, for example, of operating a pneumatic valve grinder is about the same as that for an electrically-driven tool.

Air Jack Handy Equipment

In some shops where heavy vehicles and especially trucks are serviced an air jack is a handy piece of equipment. With more and more large vehicles such as motor buses and interurban coaches coming into use the small shop may have occasion for a suitable jack and the air jack is admirably suited to this need. Some resourceful mechanics even have used air jacks at times in the capacity of a press. A small compressor will take care of such a jack in addition to the usual inflation requirements.

The Possibilities of Compressed Air in the Automotive Shop

It can be used with certain pieces of equipment for—

- 1—*Tire inflation.*
- 2—*Cleaning upholstery.*
- 3—*Cleaning stock bins and shelves.*
- 4—*Cleaning small parts.*
- 5—*Spraying engines, etc.*
- 6—*Spraying paints.*
- 7—*Drying wire wheels, etc.*
- 8—*Drying fuel tanks before soldering.*
- 9—*Drying small parts, bearings, etc.*
- 10—*Blowing carbon from cylinders, etc.*
- 11—*Operating air hammers.*
- 12—*Operating chipping hammer.*
- 13—*Operating pneumatic valve grinder.*
- 14—*Operating an air jack.*
- 15—*Operating a torch.*
- 16—*Oil-spraying springs, etc.*
- 17—*Hastening washing of chassis parts.*
- 18—*Facilitating flat rate operations.*

There is a limited use for the pneumatically operated chipping hammer in the automotive shop. The shop catering especially to large trucks will find use for it. It can be used for a variety of work such as metal cutting, riveting, regrooving solid tires which have been worn smooth, etc. The very large shop where considerable riveting is done will have use for an air hammer, but such a hammer cannot be operated from the usual type garage air compressor, as it calls for pressures up to 100 lbs. with a delivery of some 15 cu. ft. of air per minute.

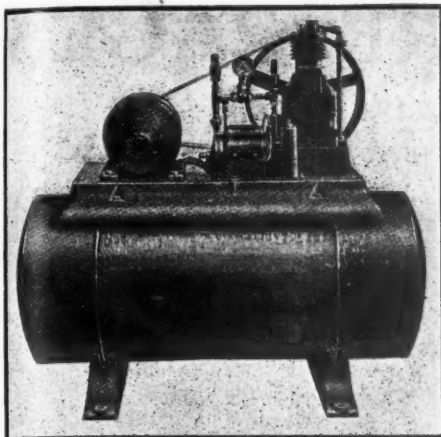
An air torch operated in the hands of a specialist has a place in the automotive shop. It can be used for burning off paint from bodies, soldering, lead burning in the battery department and annealing. Acetylene, gas, Prest-O-Lite, etc., are used with the air pressure.

Valuable for Refinishing Cars

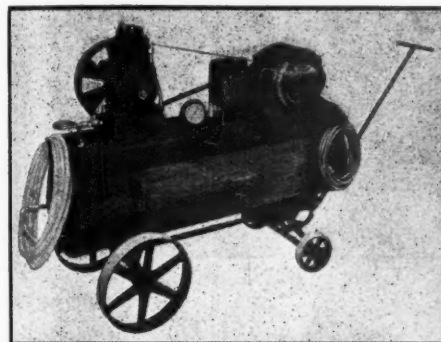
For refinishing cars there is nothing like compressed air for cleaning the car and spraying on the color. A simple paint gun is used for this and the other apparatus needed is low in cost for the garage or service station where painting is not a daily job. Especially is the spray gun useful on such parts as wire wheels. Pressures of from 25 to 40 lbs. are necessary and the air consumption varies with the kind of paint used. Usually a 3-4 h.p. compressor or outfit will take care of one spray gun.

So far as possible every mechanic should be provided with an air hose and nozzle attachment at his bench. With it he can clean parts quickly and this hastens operations done on the flat rate basis. Frequently it takes a mechanic as long to clean and prepare parts as it does to perform the actual operation of removing or installing parts. It always has been a tedious job to clean parts by hand, but compressed air used with liquids does it in a hurry and does it well.

It always is possible to find some new use for equipment in the shop and of all equipment compressed air offers about as many inducements for the resourceful mechanic as any other. Practically all of the above mentioned uses of air have been applied in one form or another and while in the majority of cases air is used for tire inflation only, the shop operator and dealer are urged to put into effect as many of the others as they find profitable.

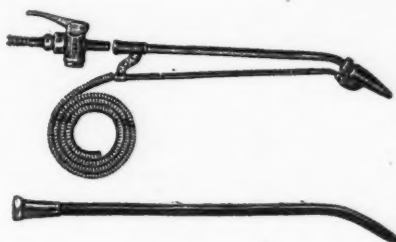


A heavy duty outfit meeting every degree of air demand. It will take care of all shop requirements as well as tire inflations of all kinds

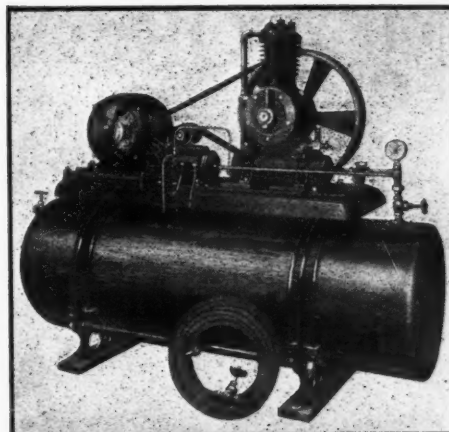


It is possible to get portable air equipment and here is shown a typical instance. A small shop, especially, finds such an outfit practical. Most small shops are not equipped with a sufficiently large compressor to warrant running air lines into different parts of the building and hence the portable outfits are the most economical. They are a great convenience especially during the touring seasons

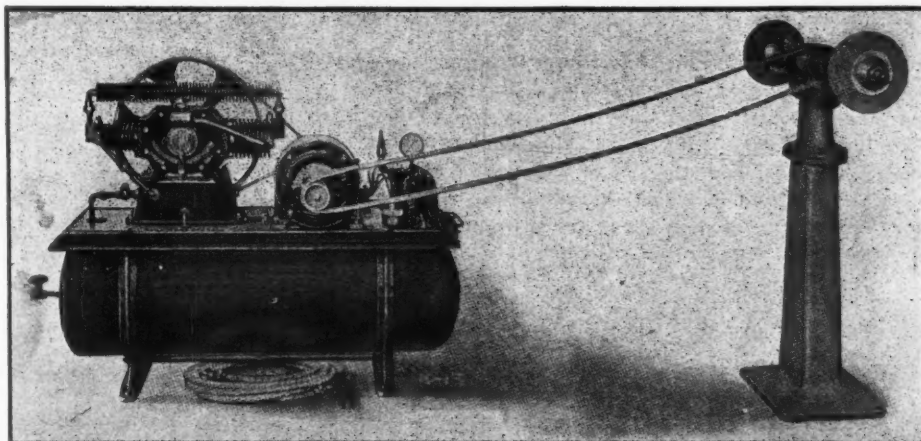
Some Typical Installations and Uses of Air Compressors in the Automotive Shop



A combination air gun and engine cleaner which can be used to advantage in the automotive shop. The extension nozzle is for blowing out carbon, etc.



This air compressor outfit is useful for cleaning bearings, gears, operating a cleaning gun for transmissions and differentials, spraying springs, etc., in addition to tire inflation requirements



Here the air compressor outfit is shown with a motor having extension shaft and pulley for operating a line shaft or buffing machine

25 Years Ago In the Automobile Industry As Recorded In MOTOR AGE

(From MOTOR AGE of Feb. 15, 1900)

New Yorkers Are Enthusiastic

NEW YORK, Feb. 8.—Interest in automobilism seems to be universally permeating. Every line written and every lecture delivered on the subject is received with eager attention. Even organizations not specifically devoted to the new locomotion are taking it up and furnishing information to their members. For instance, Harold H. Eames, general manager of the Columbia Electric Vehicle Co., has been secured to lecture on "Electric and Gasoline Automobiles" in the theater of the Knickerbocker Athletic Club on March 22. Following the lecture gasoline and electric vehicles will be exhibited in the club gymnasium.

1,000 Miles in Automobiles

LONDON, Feb. 7.—It is now settled that the Automobile Club thousand-mile trial is to take place from April 23 to

May 12. It is probable that from 35 to 50 motor vehicles will take part in the trial. The distances to be traversed daily vary from 80 to 124 miles.

Motor Fire Engines Gaining Favor

PHILADELPHIA, Feb. 12.—During the coming week Director English, of the Department of Public Safety, will visit Boston for the purpose of inspecting the horseless fire engines used by that municipality. It is the director's intention to obtain all the information possible concerning the practical working of this modern fire-fighting appliance to enable him to embody the same whenever feasible in the system at present in vogue here.

News Notes

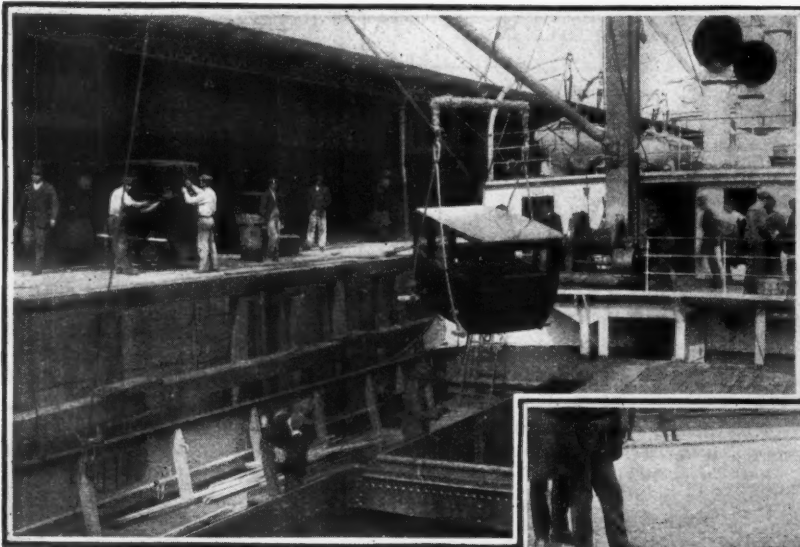
Cleveland now has an automobile club. The new organization numbers about 30

members. Plans are being made to supplement the annual Decoration Day bicycle road and track races with automobile competitions.

Alfred Harmsworth, owner of the London *Daily Mail*, who is among the enthusiastic automobilists in England, starts from Calais Saturday in a new 12-h.p. Panhard machine to make his yearly pilgrimage to the Riviera. The distance from Calais to Nice will be done entirely in his automobile.

An arch surmounted by a reproduction of the latest type of automobile is soon to be erected at the extremity of the Avenue de la Grand Armee in Paris to the memory of Lavassor. Lavassor did much to promote the interests of the automobile. This is doubtless the first instance of the introduction of the motor vehicle into sculpture.

MOTOR AGE'S PICTURE PAGES



SHIPPING FORD BODIES BY WATER. S. S. Oneida, owned by the Ford Motor Co., taking on Ford bodies at the Chalmette branch of the company, just below New Orleans. These bodies were assembled in the Chalmette branch and were destined for Houston, Texas. The Oneida was on her maiden trip to the South having touched at Jacksonville, Fla., where there is a Ford branch.

SIGNS OF THE TIMES. The accompanying picture shows the laying of a rubber brick "stop" sign in an Akron street by the Goodyear Tire & Rubber Co. It is made up of letters 32 in. high, the whole section laid flush with the rest of the pavement and measuring 38 in. by 84 in. An advantage claimed for the new type of stop sign is that it is permanent and does not require frequent repainting.



32,000 IN A YEAR. Walter P. Chrysler standing beside the first and the 32,000th of the cars bearing his name. This number of cars was built during the first year of production. Birthday parties celebrating the first anniversary were held by dealers throughout the nation.

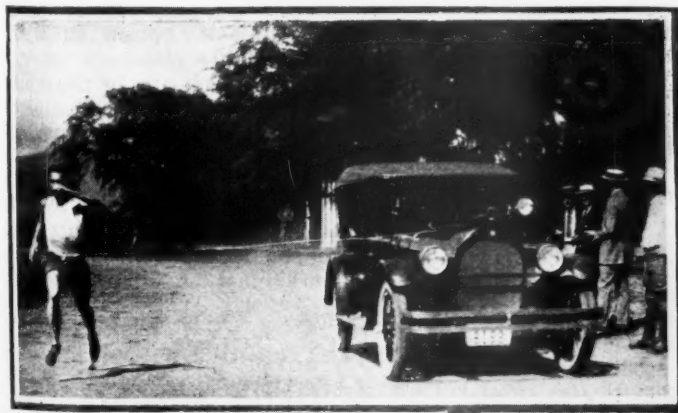


WORLD'S LONGEST AUTOMOBILE TOLL BRIDGE. It is six miles long and extends from Tampa to St. Petersburg, Fla. It reduces the former distance between these two cities by 24 miles and was built to accommodate four motor cars abreast. It crosses a section of old Tampa Bay formerly covered with waste waters, too shallow for navigation and yet too deep for the construction of an ordinary highway from shore to shore.

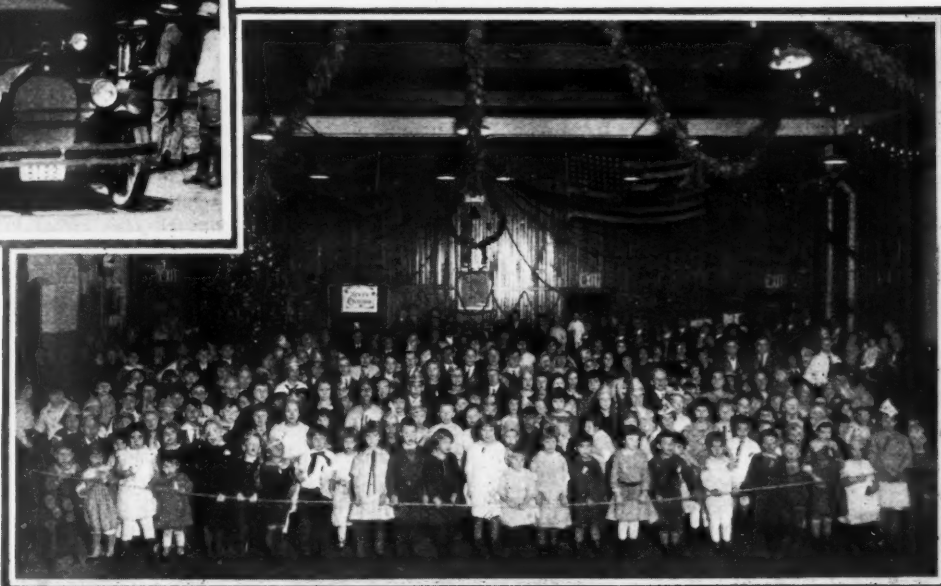
OF AUTOMOTIVE INTEREST



SOME MORE PRIZE WINNERS. Above—Display of Bolter Auto Co., Grand Junction, Colo., which captured second prize in the A. E. A. Christmas window contest. Below—Rude Auto Co., Cedar Rapids, Ia., was awarded third place. In the Feb. 5 issue of *MOTOR AGE*, page 33, a picture of the window selected as the best of the designs submitted was published.



CAR BEATS SPRINTER FROM STANDING START. An Oldsmobile six was pitted against an athlete reputed to be the best sprinter in the Hawaiian Islands. The race was for 100 yards. The runner, Dick Penhallon, was far in the lead at first, but the car came abreast less than 30 yards from the tape and from that point easily outstripped him to the finish.



FACTORY IN SANTA ROLE. Children of Rolls-Royce Company employees, 450 in all, shook hands with Santa Claus in the cafeteria room of the East Springfield, Mass., plant. The company put on its first annual Christmas party for children in the afternoon and gave a holiday dance for all employees in the evening.

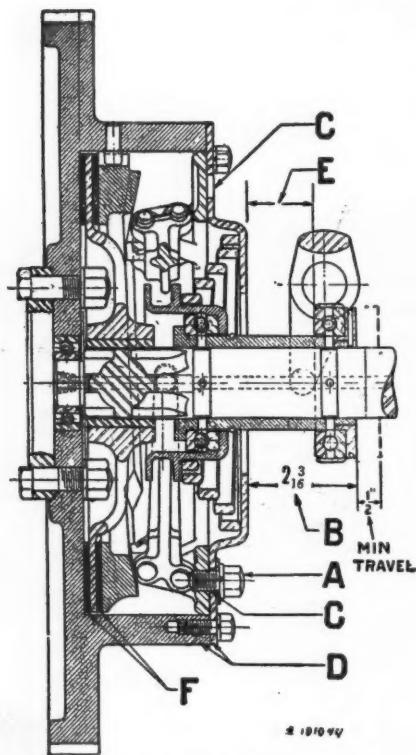
The READERS' CLEARING HOUSE

Questions and Answers on Dealers' Problems
BUILDING • ELECTRICAL • FLAT RATES
SHOP • LEGAL • PAINT & TRIM • ACCOUNTING

Directions Given for the Removal of Clutch

Q. Please give me full list of directions in removing and reinstalling Borg & Beck clutch in 1920 Chandler car. Can it be taken out and reinstalled as a unit or does it have to go back piece by piece? Is there any way to lubricate the pilot bearing on end of crankshaft where clutch slips in without taking clutch out?

To remove the clutch it will be necessary to remove the entire transmission. First uncouple drive shaft at universal joint and drop it down. Transmission is bolted to the flywheel housing with a number of bolts. Before removing these mark the clutch cover plate and the flywheel drum with prick punch marks. This is necessary as unless these parts are matched up when the clutch is assembled a great deal of trouble will be experienced. The marks are to be made on the parts marked D in the illustration at Fig. 101044. With the bolts removed the transmission case can be drawn backwards and out. With the clutch out and on the bench it is released by the pedal and locked in the release position by inserting a block $1\frac{1}{2}$ inches high and 4 inches long between the cover and the throwout yoke marked in the illustration. On the back of the throwout yoke you



Borg and Beck clutch on Chandler

will find a cap held by four screws. These must be removed and the cap taken off. Under the cap cover is a steel collar,

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

this should be unscrewed to remove the clutch spring. After reassembling the clutch and installing it on the engine you will have to adjust it. Remove the large cover plate just in front of the bearing shaft lever on the transmission and turn the engine over so you can see the two adjusting nuts. Release the clutch pedal and with the clutch held out release both bolts. Adjustment is secured by turning in a clockwise direction to tighten and anti-clockwise direction to loosen. The clutch will be in proper adjustment when the distance between brake faces at the back of the throwout yoke is about $\frac{1}{2}$ inch as shown in the illustration. Do not neglect to tighten adjusting nut. Another point to check is the distance between the clutch lever or pedal and the car floor board. This should be from $\frac{3}{8}$ to $\frac{1}{2}$ inch. Under no circumstances must the clutch pedal lever touch the board. The pilot bearing is lubricated while clutch is dismantled.

3. Can you give me a simple direction to make a home made medical vibrator. Can the Ford coil and vibrator be used?—A Subscriber.

Such information is not available.

Liberation of Heat Units Basis of Power

Q. I would like to know if gasoline of a specific gravity of 65 or 66 degrees will give as much power and as much mileage as gasoline which tests only 57 to 59 degrees.—Carl L. Owenby, Kelley Motor Company, 175 North Broadway, Bartow, Fla.

The amount of power available in gasoline depends on the number of heat units which is generally greater in the gasolines which have a low test point. The difficulty arises, however, in vaporizing heavy fuel of this kind and of course if the fuel is not vaporized it will not burn properly and the available power will not be realized. However, if we could assume that both fuels would be perfectly vaporized then the most power would be obtained from the gasoline which tested 57 to 59 Beaume, this being the name of the scale by which the gravity of gasoline is ordinarily measured.

NORTHWAY VALVE TIMING

Q. Will you please give me the address of the Northway Motor Company who manufacture the motor used in the model B-39 Scripps Booth cars. Also give me the correct valve timing or setting for the above mentioned engine.—W. C. Ludwick, care The Buckeye Pipe Line Company, Steubenville, Ohio.

The address of the Northway Motor Manufacturing Company is Holbrook Avenue & G. T. R. R., Detroit, Michigan. In the first place the clearance between valve stems and rocker arm or the tappet clearance as it is often called should be .008 of an inch. When the piston is $\frac{1}{32}$ of an inch past upper dead center the exhaust valve should be just closed. The inlet valve opens almost immediately after. Before removing any gear turn crankshaft and punch all gears or line up the marks that are already on the gears.

MAINTENANCE OF 4 WHEEL BRAKES

Q. I am interested in the installation and adjustment of four wheel brakes of all types and would be pleased to know if you can give me any information from a service man's standpoint relative to same. I have read in your past issues of MOTOR AGE the four wheel brake equipment of the different cars but do not find where you say anything about equalizing the brakes.—A. Senick, Lincoln Place, Penn.

There was a long article in the November 1st, 1923, issue of MOTOR AGE and another one in the November 8th, 1923, issue of MOTOR AGE along these lines, giving information that the maintenance man should know about four wheel brakes. We would, accordingly, suggest that you study these articles carefully and as it is possible that these issues of MOTOR AGE may have been mislaid we are mailing you by separate letter the sheets in question.

The Readers' Clearing House

Building for Service, Storage and Accessory Sales

Q.—The enclosed crude sketch shows lot No. 3 marked with an X. The firm whose automotive maintenance I care for are going to build a super-service station on this lot. Would it be asking too much to have this problem brought before the planning department. We want one gasoline pump, located not too conspicuous, but still so that it will draw trade. Shop layout so that I can do top overhaul, heavy overhaul.

Battery work I will farm out.

Ignition work myself.

Electrical work myself.

Tires.

Oils and grease together with grease rack.

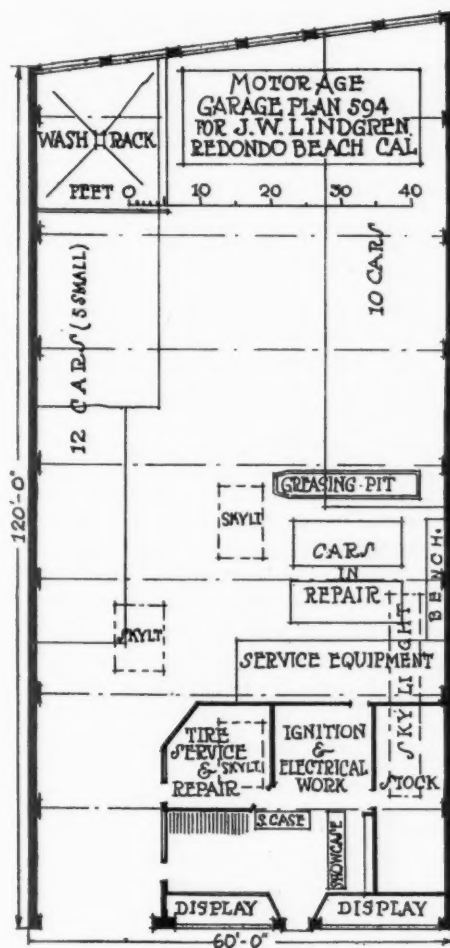
Washing and polishing, including steam cleaning.

Accessories would appreciate a list of your selection. Air and water for service and work. The company will put in the equipment and I will operate on salary and percentage. The lot has certain restrictions. The back of lot on 61 foot dimension has a pole line so I cannot have a rear entrance. Also I must provide storage space for 21 cars from Ford to Cadillac.—J. W. Lingren, Palos Verdes Project, Redondo Beach, Calif.

Like nearly all mechanics seeking information on the building question your wishes are larger than your space, something akin to the small boy whose eyes are larger than his stomach. Everything would have been O. K. had you not specified storage space for 21 cars. This can only be done at the expense of repair shop space or other departments. By leaving space for only two cars in the repair shop, utilizing the wash-rack for storage at night and utilizing the greasing rack when not in operation we have been able to find storage space for 22 cars, and hope this will meet with your approval.

Shop Can Be Made as Flexible as Desired

You have one advantage in this building and that is it is wide enough so that you can have service along one side and storage on the other. In this way by extending the bench to the rear from where we have shown it you can make your shop as flexible as you desire using the whole side for service if necessary or using the side for storage if there is no service to be given. If this flexibility is a desirable feature we would advise moving the greasing pit to the extreme rear using the last storage space for it, so that it would not be in the way of other service. On the other hand it is



Shops are arranged so that tire and electrical men can watch the accessory store and gas pump

not a bad idea to leave the pit where it is so that it may be used for connecting rod adjustment etc., along with other service. The front of the building is arranged so that while you are busy at ignition and electrical work you will be handy to watch accessory sales and so that your assistant may take care of the gas pump.

There is really no compromise for the position of the pump. It must be outside at the curb or inside there being not room enough for a drive in filling station and it would not be advisable to cut down the size of your building to that extent anyway.

Improved Type of Carburetor Required

Q.—We have a 1918 Oakland with a Marvel carburetor that we cannot seem to get adjusted as it should be. We can adjust the needle valve so it will idle good but it will not pick up, in fact if you try to accelerate very fast the engine will not hit at all and will die for lack of gasoline. It does not make any difference where we set the high speed adjustment and we have put in new high speed jet but this does not improve the operation. We have compromised somewhat and the engine seems to pull pretty good but skips some on very slow speed and only makes 17 miles to the gallon of gasoline. Do you think this trouble could be in the float level not being right? Are we expecting too much of this model carburetor? We have heard that by getting a new bottom part of carburetor it could be remedied but we cannot see how this could be.—Anaheim Reader

The carburetor on the car was all right for the fuel of 1918 but for present-day fuel it should be rebuilt to conform to the more recent specifications. The reason that a new lower part of the carburetor will improve the operation is that it contains a dash pot which controls the operation of the air valve at high speed. When accelerating this air valve opens immediately with your present carburetor, thus weakening the mixture so much that the engine will hardly operate. With the new type the opening of the air valve will be delayed until the engine has time to pick up its speed. This of course will give better operation. On the later model Oakland cars this feature was incorporated and there was also a hot air connection from the exhaust pipe which carried heat to the carburetor.

INCREASING THE VISIBILITY

Q. Will you please tell me what chemicals or preparations are used to keep windshields clear of rain and steam or fog?—Paul H. Brown, 21 Pearl street, Bradford, Pa.

In the Scientific American Encyclopedia of formulas there are two solutions given. One of these is pure glycerin while the other is glycerin dissolved in alcohol, 55 grams of glycerin being used with 1 liter of alcohol, to which a little amber oil is added for scent. There are also a number of solutions advertised for this purpose and one windshield wiper at least is on the market which consists of a bar of felt impregnated with a chemical of some sort, the action of rubbing the felt across the glass serving to spread a film of the chemical, which prevents the rain forming in drops. A very thin light oil such as "3 in 1" oil is also effectual in keeping a glass clear in rain or fog.

Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

Number of cars on sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.

The
Readers'
Clearing
House

Clearing Up Electrical

Automotive Electrical Information

Edited by A. H. Packer

How MOTOR AGE Helps

What's an electrical problem? How can we say when no one knows what electricity is? This one thing we do know, that electrical problems more than anything else cause a car to get stuck on the road. Electrical troubles bother the mechanic more than any other one thing.

You can not separate electrical problems from carburetion and starting problems. Even knocks may not be in the bearings, ignition improperly set may be at fault. That is why the MOTOR AGE help to the boys on the firing line in the electrical and battery shops, combined with the mechanical hints that the other departments contain, is bringing home the bacon.

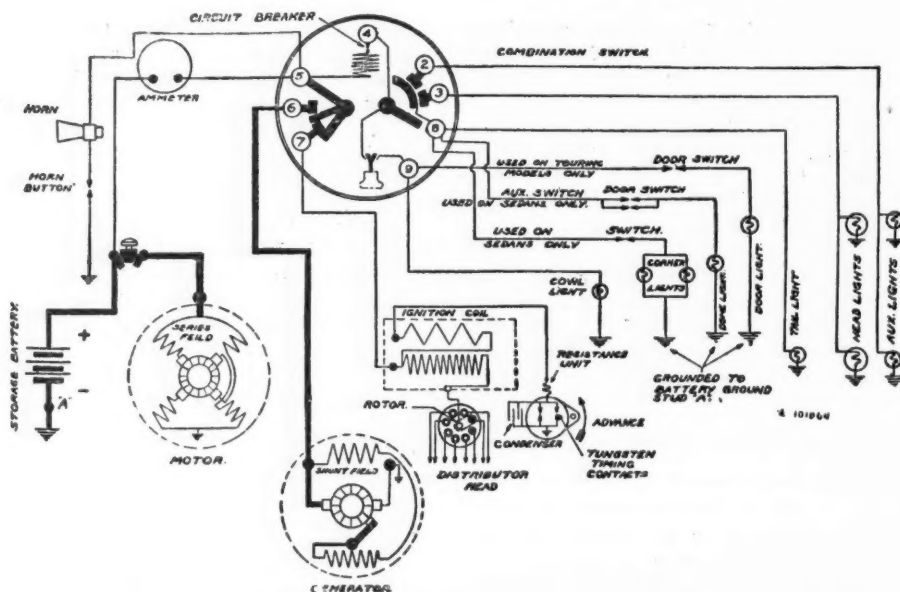
Write us about your electrical problems. Our job is to help. Then if you know a way of making some electrical test better than the next fellow, pass that along too.

Answers to Questions

WIRING DIAGRAM ON COLE EIGHT

Q.—Please send me by return mail the following wiring diagram for 1920, 1921 and 1922 Cole eight with Delco ignition system.—Lawrence Harper, 136 6th street, Valley Junction, Iowa.

Diagram requested is shown at Fig. 101064.



Delco motor generator and the wires that go with it

May Be Defective Condenser

Q.—I have a Studebaker light six which I cannot get to start correctly. This car sputters and misses on one or more cylinders. I get spark into the coils from switch and get good spark into distributor point terminal but very little at the points. I can get none out of top of coil at good cranking speed. Try two coils to start the old one and it is the same case. Cylinders are full of gas but no spark to the plugs. At the back of the distributor is attached a little round metal box which has a wire connecting with the distributor. What is this thing for? I removed it and soldered the wire leading from it which was loose. What part does the box play?

The box referred to is the condenser of the Wagner ignition interrupter and distributor. It is our impression that the condenser is defective and although you have installed a couple of coils they have had no effect toward improving the spark because of the fact that in this system the condenser is a separate unit mounted on the distributor casting. Our suggestion is that you secure a new condenser unit and install it or else take the car to a competent mechanic.

2. I would also like to have you give me a wiring diagram and proper valve clearance of this car.—D. W. Schunight, 721 Stickney avenue, Toledo, Ohio.

The wiring diagram is being mailed to you. Recommended tappet clearance is .004 to .005 of an inch when the engine is cool.

As our records indicate that you are not actively engaged in the business we would suggest that you take the car direct to an authorized Studebaker service station in case none of our suggestions enable you to cure the trouble.

What You Pay For in Charging From Light- ing Plant

Q.—Would a 32-volt lighting plant hurt a storage battery any worse charging it at 15 amperes to start with than a Ford generator would at 15 amperes? We mean by using a lamp bank in connection with the 32-volt plant.

As far as the 6 volt battery is concerned it does not make any difference whether the 15 amperes comes from a Ford generator or from a 32 volt battery, or from a 110 volt direct current line. The difference however, between the voltage of the battery being charged and the voltage of the source of current must be made up in the voltage which is wasted or thrown away. Subtracting 6 volts from 32 volts we have 26 volts which must be wasted in operating the lamp bank. This means that if you have paid good money to buy gasoline to run an engine to charge a 32 volt battery, then when you discharge the 32 volt battery you use 6/32 of the energy available and waste 26/32 of the energy in the lamp bank. Of course if you have some way of using the lamps such as an electric sign, then it is a different matter, but ordinarily this is a wasteful way of charging a battery. However, if you can charge four or five batteries at the same time, then it is a good method to use, for the cost is no more than charging one battery.

Q.—What is the specific charging rate to use in charging a 6-volt battery from 1,150 to 1,300 specific gravity?

On the name plate of a battery box you will usually find a specified rate for starting and finishing the charge. However, this is just an approximation which is right under ordinary conditions, when the plates are not badly sulphated. In starting the charge you can have the current as heavy as you wish even up to 80 or 100 amperes assuming you have equipment which will give that much current, but in a short time it will be necessary to cut down the charging current. Constant potential machines do this automatically as the battery charge comes up. Assuming that the battery does not overheat and electrolyte does not bubble or gas you can charge as rapidly as you wish. In practice however, it means that the charge must be continually reduced to prevent heating and gassing. This is the reason that a charging rate of 10 or 12 amperes is often specified so that the operator will not continually have to keep readjusting the charging rate. For the average 6 volt battery used in motor cars a charging rate of 8 or 10 amperes to start and 3 or 4 at the finish will be approximately correct.

Q.—In charging one 6 volt battery or more what would be the specified rate from a 32-volt lighting plant direct current.—S. B. Wessic, Hanbstadt, Indiana.

This information is given in answer to the previous question.

Trouble With Bill Fixit

**The
Readers'
Clearing
House**

Process of Elimination on Dodge Brothers Car

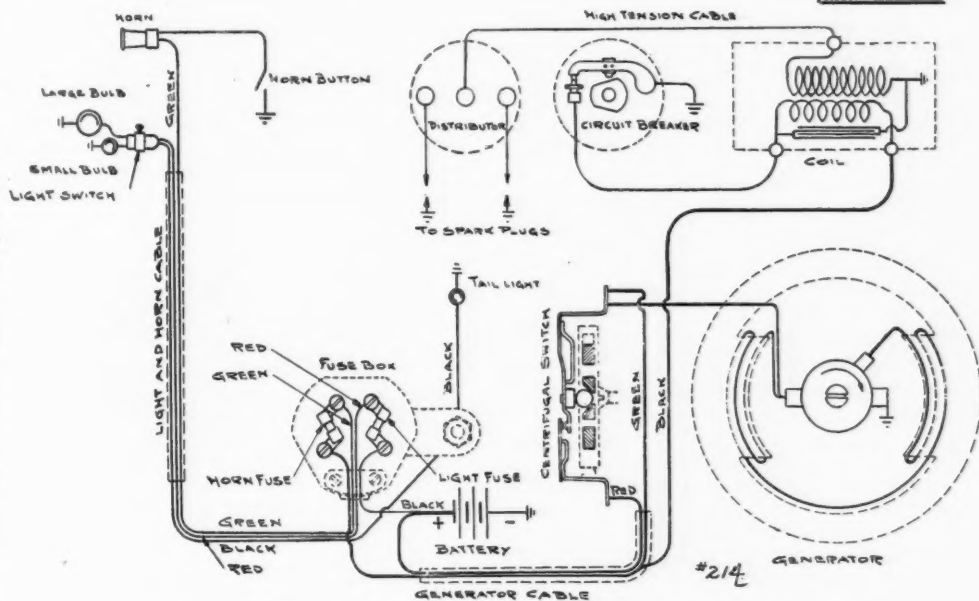
Q.—Have in mind a Dodge Brothers 1920 roadster with North East ignition. Car would run fine and plenty of power up to 35 miles per hour then would start missing if it happened to be going down hill and would continue to miss till speedometer dropped back to below 35 miles per hour. After checking everything and finding it O. K. decided it was ignition trouble, but what? Took a distributor from another car and put on and everything was perfect up to about 50 miles which was as fast as roads would permit one to drive. Then I put back the first distributor and installed a new condenser which also cured the trouble, although the old one tested perfect, but in a few days the same old trouble developed again. There is considerable play in the distributor gear, would that cause the condenser to partly burn through or what might be the cause of this trouble? This car has run about 25,000 miles and has remarkable power and pick up considering its age.—Charles Schneider. 113 S. Washington street, Casper, Wyo.

As the car has gone 25,000 miles, probably with the original points, we would suspect that interrupter points are the cause of the trouble. However, to positively eliminate the cause and trace the exact trouble would suggest that you install the points from the good ignition unit on the present interrupter mechanism, making sure that you have a tight connection at both places. If this does not permit the engine to operate satisfactorily, try the condenser that you have on, at the present time, that is, the new condenser on the new interrupter mechanism or the one taken from the other car. Then if the engine does not perform satisfactorily have the entire unit removed and tested on an electrical test bench. Badly burned points or a loose connection will produce high resistance.

RUN THIS ENGINE AT 900 R.P.M.

Q. Being a subscriber for several years and a reader for several more, we take the liberty of asking a favor of you. We have a 1912 Cadillac motor in first class shape which we wish to use to run two 1,000 watt lighting generators. We are connecting the line shaft to clutch, extending it about four feet and on this shaft we intend to place drive pulleys. Generators are each 1000 watts, 32 volts, and must run at a speed of 1800 r. p. m. As we intend running at night only we will take current direct from the generator using rheostat to control the output. We are now using our generator, running same with a small gasoline engine and are having wonderful success, but as it does not furnish us with enough light we wish to install the outfit above. What we wish to know is what would be the proper speed to run this Cadillac motor considering the wear and tear and the economy.—Monarch Auto Repair Company, Centralia, Illinois.

We recommend your running the Cadillac motor at about 900 r.p.m. which means that the pulleys on the drive shaft will have to be twice the diameter of the pulley on the generator shaft and belting the engine to the generator in this way we believe will give complete satisfaction.



Remy Electrical circuits for motorcycle

HARLEY DAVIDSON WIRING

Q. We would like to have you publish in your next issue or as soon as possible a wiring diagram of a 1920 Harley Davidson motorcycle.—C. C. Gordon, 549 White street, Dubuque, Iowa.

The diagram requested is shown at Fig. 214 at top of page.

REGULATING HUP WESTINGHOUSE GENERATOR

Q. We have a Hupmobile model K with Westinghouse generator, frame 600, style S. W. 1158 A, serial number 1410722 that charges too fast and burns batteries up. This will charge about 18 amperes at 25 miles per hour, is using a standard Dodge Brothers battery at present. All my data lists this as a third brush regulating machine but the small brush on the outfit appears to be stationary. Just what would be the best way to regulate the output of this machine to about 6 amperes.—C. E. Baird, 1828 Evelyn Street, Perry, Iowa.

The machine in question is a third brush machine and regulation of output is accomplished by shifting the entire brush ring, or holder assembly instead of the individual third brush. If you will examine the brush end of the machine you will note that there are two screws holding the holder assembly to the plate. If you loosen the screws the assembly may be turned in either direction to regulate the output to the desired amount.

This type of motor generator is used in what is known as a non-stalling system. Consequently if the car should run out of gas the motor generator would take current from the battery and continue to drive the car, as long as the battery held up. In some cases it is necessary to check the setting of the carburetor stop, for if the engine idles at too low a speed, the machine will act as a motor and draw current from the battery, making it run down rapidly.

Farm Light Battery Has Greater Ampere Hour

Q.—Please advise if it would be practical and profitable to use six Ford batteries, 13 plate type wired in series for house lights (12-50 watt lamps) instead of set of 16 regular Willard storage batteries which came with plant which is a Lalley? If this will work satisfactory I could purchase them cheaper than glass jar batteries.—A Georgia Subscriber.

The proposition resolves itself into a matter of ampere hour capacity. The Ford batteries are rated at 80 ampere hours whereas the regular Willard glass jar batteries designed for this system have a capacity of 160 ampere hours. In practical usage you will find that the Ford batteries will allow you to burn 12 bulbs for about 3½ hours without aid from the engine when they are in a fully charged condition, against the ability of the regular glass jar batteries to give from 8 to 9 hours burning without recharging. It is doubtful where Ford batteries would be ideal as regards light of the bulbs. Bearing in mind that there is approximately a 25 per cent variation between maximum and minimum voltage, it will be seen that the six batteries with a normal voltage of 36 in a fully charged condition produce a voltage at the lamps of as high as 45 and as the lamps are designed for 32 volts it is very likely that such an extra voltage would produce quick deterioration of the bulbs. If you want to use the Ford batteries use five of them, or if six, disconnect the additional two cells which will bring the voltage to 32 normal.

The Readers' Clearing House

In Which a Number of Things Are Explained

Q. Can the front main bearing on the 1924 Hudson and Essex cars be tightened without removing the timing case cover? No.

2. Can the pistons on a 1924 or 1925 Hudson be taken out through the crankcase by removing the balance weights?

It is not recommended that the balance weights be removed in order to withdraw the piston and rod assembly. No. 3 and No. 4 piston and rod assemblies can be removed from below, the other four are best removed by removing the cylinder block.

3. Can the fouling of the plugs in No. 1 and No. 6 cylinders be stopped on the Hudson cars by decreasing the oil pressure?

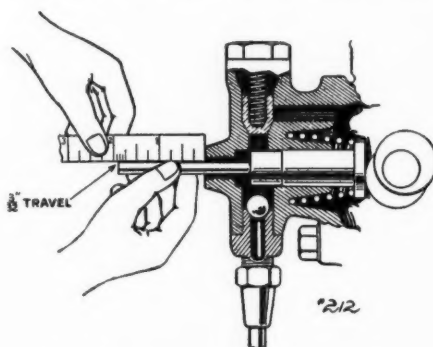
The oil pressure has no effect on the fouling and in most cases can be traced to an engine operating at too low a temperature. The owners of Hudson cars should be advised to keep the shutters closed when starting both winter and summer and to hold them in the closed position until the temperature is brought up to at least 160 to 180 degrees Fahrenheit. The No. 1 and 6 cylinders being farthest from the carburetor are consequently the coldest and the low temperature of the engine withholding when the shutters are open produces a fouling of the end cylinders.

How Oil Pressure Is Regulated

4. How is the oil pressure regulated on the Hudson and Essex cars?

On the Hudson car the pump is regulated by changing its stroke. If the car is not likely to be driven at speeds exceeding 40 miles per hour the stroke of the oil pump is cut down to 1/16 of an inch. In the case of a demonstrator or where the car is to be used for high speeds the stroke of 3/32 of an inch will be the limit when the engine is idling. Illustration at Fig. 212 shows the proper way to measure the stroke of the oil pump. Never guess at it. Remove the plug at the end of the plunger barrel as shown and insert a drill rod, tooth pick or other piece of straight stock and positively measure the amount of travel the plunger is getting from the assembly. This is the only exact way to check the adjustment. As adjustment of the oil pump may have an effect on the reading of the oil gauge bear in mind that the oil gauge is not a true indicator of the pounds pressure or the amount of oil being delivered but merely shows that the pump is operating and delivering oil to the motor. If after you have reset an oil pump plunger in such a manner as to cut down its travel and find that the gauge does not register sufficiently, increase slightly the tension on the plunger spring directly over the check valve. This will increase the gauge action. Three to three and a half pounds at fairly high speeds tell you as much as four or five

pounds and a pound pressure is sufficient for low throttle. There is no adjustment for the pump travel on the Essex and if a change is required it will be necessary to change the eccentric itself. If the gauge reading is too low it may be increased by stretching the spring on the check valve.



Checking oil pump stroke on Hudson Supersix

New eccentrics which give the Essex pump 3/16 instead of 5/16 stroke can be secured from the manufacturers of the car.

5. Is the oil pressure supposed to vary with the engine speed?

The oil pressure remains practically constant although there will be a slight variation between extremely low and extremely high speeds.

6. How many pounds pressure should the gauge show and can the pressure be decreased by decreasing the quantity of oil that is delivered by the pump?—William Alswager, Jamestown, N. Dak.

The pressure gauge does not give any idea of the quantity of oil being delivered. If the gage registered 3 pounds at high speed and one half pound at low speed it can be considered normal. Increasing the pressure does not practically affect the quantity of oil that is delivered by the pump.

TIMING GEAR SPECIFICATIONS ON OLDSMOBILE

Q.—I am subscriber of MOTOR AGE and would like to know the exact size of the generator gear and crankshaft gear for a 1924 four-cylinder sport model Oldsmobile. I would like to install fibre gears and have a number on hand but would like to know the size the above takes before tearing it down.—Charles C. Tracy, Blue Ridge Summit, Penn.

We assume that you refer to the Oldsmobile six-cylinder car, as this is the only model made in 1924. The information is as follows: The large gear, which is the one on the crankshaft, has 27 teeth, the thickness is 3/8 in. and the outside diameter is about 3 3/8 in. It may be a trifle over this but that is as near as we could measure. The hole in the center is 1 3/4 in. in diameter and the keyway is 1/4 in. wide and 1/8 in. high. There are also two holes in the gear for the use of a puller, these being tapped 3/8 in. S. A. E. The small gear which goes on the gen-

erator has 18 teeth and is 1 in. thick, which you will notice is thicker than the gear on the crankshaft. The outside diameter is 2 1/2 in., the bore through the center is 7/8 in., while the keyway is 3/4 in. wide and 3/8 in. high. The height of the teeth is 3/4 in. and the teeth are spiral cut. In trying to select from your stock gears which would do the work you will probably be able from this description to see whether you have any which are approximately right. However, the angle of the spiral has considerable to do with exact interchangeability, so it is probable that only by trying the gears and rolling one on the other will you be able to make a final test. If you have any difficulty in choosing the gears from your stock and wish to have a quiet job you might get the silent gears which are now supplied by authorized Oldsmobile service stations.

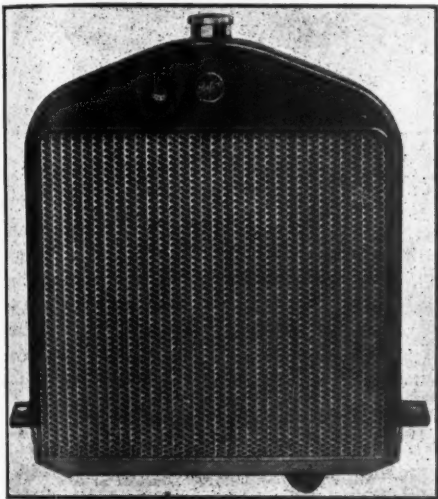
There Is Such a Thing as Piston Slap

Q.—Is there any such a thing as piston slap. I have heard claims that there was and there was not?

There is such a thing as piston slap. When the pressure is produced in the combustion chamber of an engine by the firing of the fuel, the piston is driven downward. At the same time, however, the connecting rod which transmits the force of the explosion from the piston to the crankshaft is operating at an angle. Then as the connecting rod completes a revolution it forces the piston up again and the angle is reversed. For this reason the piston is driven first against one cylinder wall and then against the other. When the piston is properly fitted and there is only a small clearance there is no noise as the pressure changes from one side to the other, for the spring of the piston ring and the cushioning effect of the oil film prevents any appreciable amount of noise. However, when the piston and cylinder walls begin to wear so that the clearance is excessive then the back and forth motion of the piston does produce a noise. In engines which are badly carbonized so that a sudden rise in pressure takes place in the combustion chamber due to detonation or spontaneous combustion the noise of piston slap will also be heard. This is due to the fact that the pressures are abnormally high, and even with the correct amount of clearance there is a noise heard as the piston moves back and forth, from one side of the cylinder to the other. This, however, is not commonly known as piston slap, for it is due to an abnormal condition such as accumulation of carbon and disappears again when the engine is cleaned out.

BOOSTING ACCESSORY SALES

THE Racine Radiator Co., Racine, Wis., has announced its new 1925 series of improved radiators for 1917-1923 and 1924 model Ford cars. The new improvements relate particularly to the tanks. Both the top and bottom tanks are made entirely of one piece of heavy-gage seamless drawn brass. Other improvements consist of top tank reinforced by longitudinal and lateral bracing ribs; lower tank made with a curved bottom. This



Perfex new series Ford replacement radiator

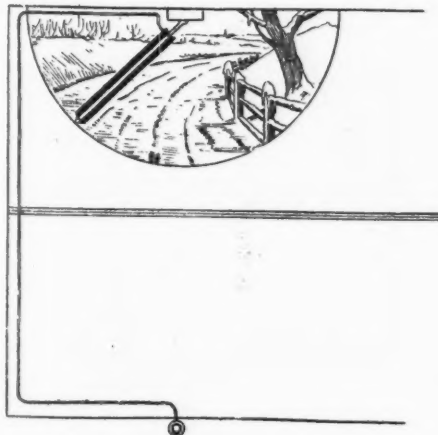
construction is designed to permit distribution of the water load in such a way as to make it impossible to break the tank. Five copper rivets are now used instead of four to fasten the inlet casting. Changes in the dies designed to improve the appearance of the shell also have been made. The new type is known as the "Perfex" series.

Hot Wype Windshield Wiper

Designed to fit all automatic windshield wipers, this device consists of a permanent electrode embedded between dual face rubber, the purpose being to melt the ice and snow faster than it can gather on the windshield. The Hot Wype draws 2½ amperes. In order to install, the present wiper is removed by taking out screw at lower end of arm; Hot Wype is then inserted, a cotter pin being used to fasten. Wires are carried to instrument board, connecting one to switch and the other to metal. The price complete with cord and switch is \$2.50. The manufacturer is Deveau-Ruckel, Inc., 109 Atlantic street, Stamford, Conn.

Cooper Radio "B" Battery

This battery has a capacity of 5,000 milli-ampere hours. The case is of oak, finished in mahogany, and the jars are of heavy clear glass. Plates of a special mix are very porous, for best results in radio work. The separators are of Port Orford cedar. A rubber rest fits in the bottom of each glass cell and forms a cushion support for the plates, which



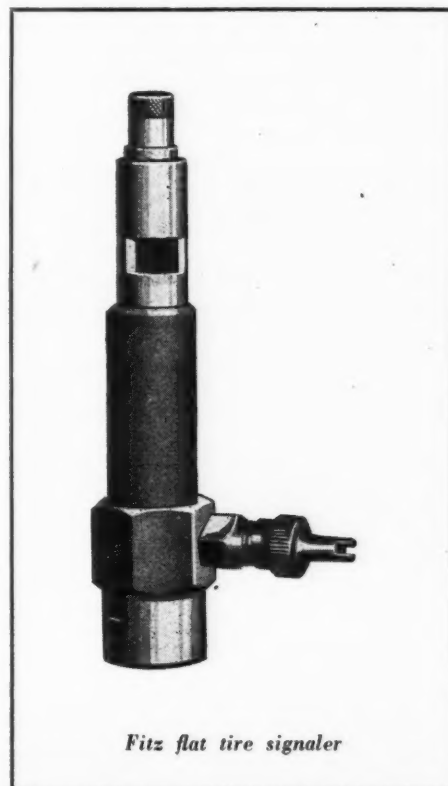
Hot Wype Windshield Wiper

also prevents short circuiting across the bottom. Each glass cell is sealed with a hard rubber cover to prevent leakage of acid, and provided with a vent hole and removeable vent plug which facilitate refilling.

The terminals are of lead, burned on to insure perfect contacts. The battery is made in 24-volt and 48-volt sizes and is a product of The Cooper Corporation factories at Cincinnati.

Fitz Flat Tire Signalers

These are designed to give warning when a tire has been punctured by whistling for nearly a minute before the tire goes flat. The side outlet provided is for the purpose of facilitating testing of air pressure and inflation of tires. The



Fitz flat tire signaler

signalers are made of aluminum and any attempt to remove them will cause them to whistle. The price is \$1.25. They are made by Chas. L. Fitz, Inc., Fond du Lac, Wis.

Rubberwear Glove

This product is intended for use in car washing and polishing, motor repair, tire changing, etc. It is a rubberized fabric glove, made of 10-ounce, long staple

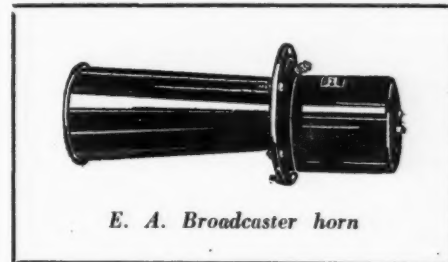


Rubberized fabric glove

cotton canvas, fleece-lined and with full gauntlet or wristlet. The entire surface is first filled with a light rubber coating, after which heavier coats of tough, long-wearing rubber compound are added. It is said that the glove is practically waterproof all over. There are four kinds—the Heavy Duty, the Full Coated, the Coated Hard and the Wristlet. It is made by the Rubberwear Glove Co., Akron, O.

Broadcaster Horn

An addition to the "EA" horn family is announced in the "Broadcaster," an electrically driven motor horn which sells for \$4. It has outside ball thrust adjustment bearing. Bracket for either



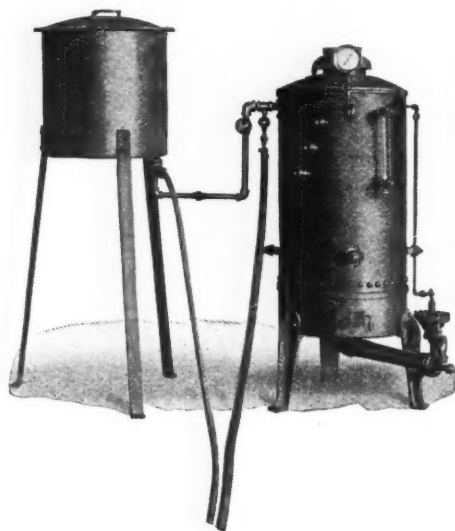
E. A. Broadcaster horn

dash or engine mounting is standard equipment with each horn. The horns come packed 20 to a carton. The size is 4¾ in. diaphragm, 10 in. length over all. E. A. Laboratories, Inc., Brooklyn, N. Y., are the manufacturers.

GETTING MORE OUT of the SHOP

THE old fashioned method of taking paint off is to use a blow torch and a putty knife and the old fashioned method of cleaning dirty parts is to wash them in gasoline. The paint removal process is slow and expensive and the gasoline method of washing is unsatisfactory and involves a fire hazard.

In the more modern automotive establishments there is a tendency to install equipment for cleaning parts with steam or with steam and an alkali solution of some sort. The illustration which shows the McKee auto cleaning outfit made by the Eclipse Fuel Engineering Company of Rockford, Illinois, gives a general idea of equipment of this nature. The solution to be used for cleaning is contained



McKee cleaning outfit

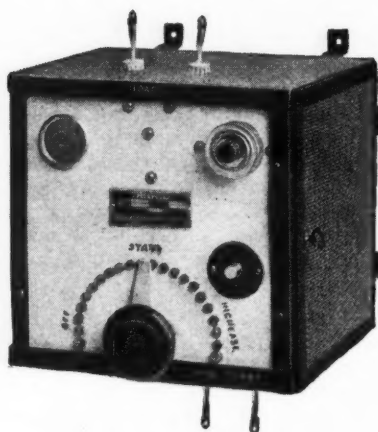
in the tank at the left while the boiler at the right generates the steam both for heating the solution and for cleaning. Steam from the boiler is allowed to pass through the solution at the left until its temperature is very near to the boiling point. The operator then uses the double orifice nozzle to throw a stream of alkali and steam on the parts to be cleaned.

Debco Battery Charger

Two charging devices are made by the Detroit Battery Charger Co., now owned and operated by the Premier Manufacturing Co. of Detroit. One of these is known as the Debco Senior and is capable of charging 15 batteries in series. It sells for \$75. The other is a small unit designed for the car owner or operator of a radio receiving set. It handles either A, B or C batteries and sells for \$18 without bulb.

Interchangeable Cutter Broach

The interchangeable cutter broach is a separate cutter tool in which the cutters may be detached and is not of the usual solid type in which the cutters are integral with the body of the broach. The illustration herewith shows the general



Debco battery charger

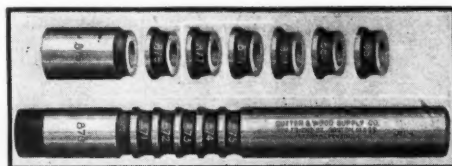
construction of the interchangeable broach.

It will be found useful in broaching connecting rods, piston pin bushings, steering knuckles, pulleys, gears, etc. The interchangeable feature of the broach makes it possible to order even larger cutters than those ordinarily furnished. As regularly furnished, the company includes an extra pilot and six extra oversize cutters from which full set a selection can be made that will broach any intermediate size hole by .001 inch steps between the standard broach size and .006 inch oversize inclusive.

For alignment work, where the span between holes is too great for the regular pilot to function, it will be found that the cutters may be reversed on the stem and the shank of tool used as a pilot.

Damaged or broken cutters may be replaced at a moderate cost, obviating the necessity of discarding a whole tool.

The broach as assembled for broaching standard size comprises a body, a pilot and five cutters. The company also



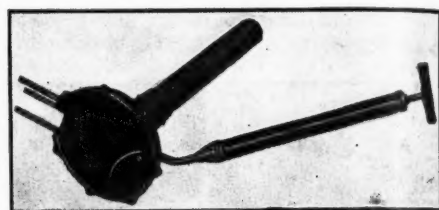
The Interchangeable Broach showing how the cutters are assembled to the stem and pilot

makes a broach press for bench use which has a capacity of 14 in. diameter work, 14 in. stroke and a leverage of 1 to 48. The price of the press is \$40. The above equipment is made by Cutter & Wood Supply Co., 274 Friend street, Boston, Mass.

Coil's Differential Cleaner

Everyone knows that it is quite a job to get the old lubricant out of such housings which have a drain plug at the side. To meet this difficulty Coil's differential cleaner has been brought out by the Coil

Manufacturing Co., Evansville, Ind. The barrel of the device is made of 20-gage material 15 in. long and 1½ in. in diameter. It is black enameled and the handle is of stained hardwood. The nozzle is steel, ½ in. in diameter, while the piston rod is ⅜ in. in diameter and 18 in. long. The cap is machined. This device



Coils Differential Cleaner showing reach of nozzle

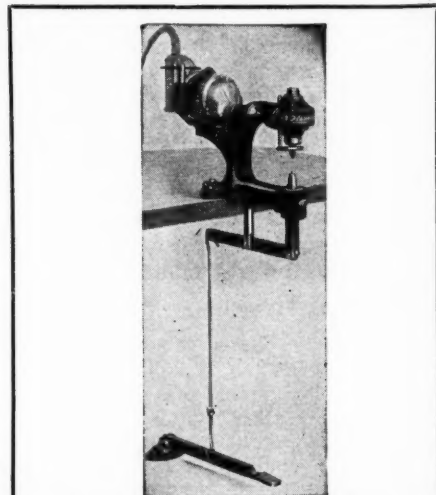
in addition to removing old lubricant can also be used to flush the gears and for refilling the housings. It is claimed the device is practically indestructible. The retail price is \$3.50. In the illustration it will be noted that the nozzle reaches clear to the bottom of the housing.

Fleming Brake Lining Machine

Fleming Machine Co., Worcester, Mass., are the manufacturers of this. It drills and countersinks in one operation, locating accurately through the holes in the brake band. This equipment is sold by the General Asbestos & Rubber Co., Charleston, S. C., manufacturers of Garco brake lining. The machine is operated by a ¼-in. Black & Decker electric drill, which can be removed and used for other purposes.

CORRECTION ON K. R. W. GENERATOR TEST STAND

In describing this device on page 13 of the Feb. 5, 1925, issue of MOTOR AGE the word "not" was omitted in the sixth line of the description. The sentence should read, "In testing a Ford generator on this stand it is NOT necessary to remove the spiral gear."



Fleming brake relining machine

EDITORIAL

Time to Think About Roads

THE future development of the automobile business depends to a great extent upon the highways, roads and streets provided for motor vehicles to run upon. From the national aspect this matter is being very well taken care of. The Federal Government has under way a great highway improvement program that already has added thousands of miles of improved roads.

But the local aspect has not been so well provided for. Some states have undertaken extensive programs for the construction of permanent roads, but nowhere are the roads sufficient for the traffic that is waiting.

Every automobile dealer is vitally interested in roads. His bread and butter depends upon continuous development and improvement of highways. The effect of improved roads is not merely in providing a track for cars to travel. A more important effect is the economic one of increasing the prosperity of the country so that more people can afford to own and operate automobiles.

This is law-making time and one of the important functions of the lawmakers is to look out for our highway systems. Automotive trade associations throughout the country should see that the legislators do not overlook this important job.

Accessory Business Looks Up

EQUIPMENT on new automobiles coming from factories today is more complete than ever before. Bumpers, shock absorbers, spot and stop lights, mirrors, windshield cleaners and many other useful devices are found on many cars just as they come from the factory. In the light of this development many persons in the industry are inclined to look upon the accessory business of the independent manufacturers, jobbers and dealers as a declining enterprise.

We believe they are losing heart too soon. It is true some slight, and temporary, recession in accessory business might be charged to this development. But in the end the popularizing of these accessories by the manufacturers should result in a much greater demand for useful merchandise of this type. While many models are being sent out from factories completely equipped there are other models, which, for the sake of keeping price down, will be sold bare of accessories. The owners of these cars all are good prospects for the sale of accessories.

Then the cars that go out completely equipped will provide a wonderful market for replacement of accessories.

Many accessories, no matter how well made, cannot be counted upon to last as long as the car. Or the owner may not be satisfied with the original equipment and may be favorably inclined toward the purchase of a replacement article that he is convinced is superior.

All these possibilities open up to the aggressive automotive merchant an opportunity for sales beyond anything the accessory market has provided heretofore. The live institutions in both the manufacturing and the retail field will no doubt be quick to take advantage of the situation.

The Electrical End of the Business

THE report of the road service department of the Chicago Motor Club for 1924 shows that out of 25,646 calls answered in the course of the year 10,605 were on account of "ignition" trouble and 3,989 on account of battery trouble. Thus more than half of the calls were of a nature requiring the services of men skilled in the principles of electricity as applied to the automobile.

It is possible that a good many of the calls reporting ignition trouble were in fact due to some other cause, but certainly a very large proportion of them were jobs for the electrical maintenance man.

As a tremendously important end of the automotive business maintenance is attracting more intelligent management and more skilled performance until it is becoming a highly profitable branch of the industry. And electrical service is so important a part of the whole maintenance business that no automotive dealer or repairman can afford to overlook it.

Truth Profitable

A GOLD medal for a campaign for Truth in Advertising was one of the rewards recently announced as being bestowed on the National Vigilance Committee of the Associated Advertising Clubs of the World, but gold medals are not the only reward available for work of this kind. The greatest builder of business is procedure which gets public confidence, no matter whether it is the business of a single mechanic starting in a barn or a large corporation whose ramifications cover a world.

We are all advertisers, whether we take space in newspapers or not, for the first part of the word means "to turn to," and the successful dealer is the one who by his manner, fair treatment and methods makes the car owners "turn to" him for their automotive needs.

Year Gets Off With Good Business Stride for Automobile Trade

CHICAGO, Feb. 9.—A record of sales that surpassed those of the closing month of the old year and in an unexpected number of cases exceeding those of the same month of 1924, is the trend revealed in the reports of retail sales conditions for January, 1925, sent to MOTOR AGE from all the important centers of the country. The only discordant note in the generally cheerful tone of the statements is that pertaining to sales of used cars. These have not been going so well, but the demand for new cars has exceeded that of a year ago, according to the reports, taken as a whole, and stocks are low.

Retail dealers did not start the new year with heavy inventories. If, as the open weather months approach, the demand keeps up on a comparative scale as noted in January, increasing of schedules by quite a few manufacturers will be necessary. The favorable response on the part of the public to the general introduction of the closed car as the standard, with the accompanying lowering of prices for models of this kind, has served to stabilize the market. Henceforth not so many automobiles will be stored away during cold weather and there will be an increased lessening of the tendency to wait for the advent of spring before making purchases.

Shows Help Sales

Although money rates have continued low, reports from the various sections tend to indicate that there may be a gradual stiffening of rates for funds in the ensuing months. The shows stimulated sales wherever they were held. Those cities which still are to have their annual exhibits report a holding off of buyers until they have an opportunity to examine all the new models. Analyses of the conditions which these communities anticipate they will have to report for February are favorable.

From the farthest point West in the territory covered in the review comes this favorable dispatch:

"Business for the new year in Seattle and the Pacific Northwest opened up in pleasing fashion and this January will show heavier sales than the same month a year ago and heavier than the last few months. The lumber industry is on a good basis and the rural buying sections are in a better buying mood than they have been for some time. Stocks on hand are nominal and the used car situation is not over burdensome to the average dealer."

Des Moines, out in the State where the farmer is enthralled by the idea of getting a good price for his wheat, sends this message:

"Brighter weather during January helped to make the month's sales in al-

most all lines of cars better than during the last month of 1924. The opening month of 1925 likewise was better than the same month last year. While the movement of used cars is anything but brisk, this phase of the industry is better than usual. Rural dealers are stocking heavier in anticipation of much better business. More inquiries have been re-

The accompanying survey of conditions in the automobile retail field offers further evidence of a toning up of the nation's economic structure. There was an improvement in December and January reports from many important market centers tell of a continuance of the forward movement. The country has not been traveling toward greater stability at a rapid rate but rather, with the steady, certain step indicative of healthful conservatism, careful calculations and sane policies that now are characterizing business generally.

Business has been THINKING its way and there will be profits this year for the automobile dealer who THINKS his way. The automobile dealer, from all indications, now stands on the threshold of an opportunity that will mean to him whatever he makes out of it. His returns will be measured by the extent of CHAMPIONSHIP STUFF that he puts into his operations.

ceived by distributors than for some time."

All Set for "Full Ahead"

Michigan voices the situation that prevails in a number of States. It reports that, "starting with the annual automobile show here, retail business has shown a decided change for the better and dealers are looking for a continuance through the early part of the year at least. Sales at the Detroit show and since then have been on a par, if not exceeding any similar period, although deliveries are delayed in some lines owing to a temporary shortage of several closed models. There is a normal number of used cars in dealers' hands, but these will move rapidly as there is a continuance of promised favorable industrial conditions. To some extent there has been a concentration of sales in fewer dealerships, but all changes are now about through for the season and everything is set for a steady full ahead, the correspondent says.

From the Rocky Mountain territory comes one of the most optimistic reports.

Denver sends this dispatch: "January automobile sales in most lines have been the best in history here. The expected post-Christmas slump turned into an increase. Prospects are better than ever. Light models are in great demand. Expensive machines show a corresponding increase. Dealers are planning for much expansion. Truck prospects are bright."

Milwaukee reports that under the stimulus of the annual show passenger car sales are marked by a very distinctive upward curve which is fully expected to be sustained in February.

Recovers From Slump

Salt Lake City reports that the automobile business has recovered from the slump caused by the below-zero weather. The used car situation is reported as fair and that the general outlook is exceptionally good. "Everyone believes 1925 will be the best in Utah's recent history."

Kansas City reports that new car sales increased substantially over December and January a year ago and that there has been an increase in the proportion of sales to persons who have the ready money to pay for cars purchased.

Minneapolis reports that there is nothing but optimism in the Twin Cities as to the present and future of automotive business. The correspondent says the fact that farmers have had money to pay their bills has had a strong uplifting effect and the money again is in circulation after having been paid to the banks to take up notes and other forms of indebtedness.

In the Chicago territory general expectations in the retail field are for a healthful pickup as the result of seasonal interest, the show incentive and the betterment of conditions. January for the trade at large there was a normal January, which means a limited volume of business. There was a hesitancy by prospects who wanted to hold off until after an opportunity to make comparisons of models at the show. Used car sales probably declined slightly, as compared with December, with used car stocks remaining about the same.

Los Angeles reports no perceptible stimulation in January sales, but says the demand for closed models, even in that sunny section, continues to increase. The rural business there is reported as slow, with the used car business very quiet.

From Indianapolis comes information that sales conditions in Indiana are in a healthy state. Buying there does not become brisk until after the show, which is booked for the first week in March this year. Distributors agree that the March business promises to be up to last year's peak.

(Continued on page 35)

Mild Weather Contributes to Success of Show at St. Paul

Exhibits Displayed by 252 Firms Most of Whom Took Larger Space Than in Past

ST. PAUL, Minn., Feb. 9.—Old Man Weather conspired with the Minneapolis Automobile Trade Association to make the Eighteenth Annual Northwestern Exposition in the Overland building, St. Paul, a big success. The show was held from Jan. 30 through Feb. 7.

While usually it is cold weather for this show this year it has been mild, which helped attendance. Under the new management of H. E. Wilcox changes were made in arrangements of exhibits so that the buses, trucks, taxicabs, passenger cars, accessories, industrial and style shows had distinct portions of the three floors that were utilized.

The extent to which buses and trucks have invaded the transportation field was evidenced by the unusually large display of automotive equipment for these means of travel.

Radio had a large part in the automobile show.

Attendance of factory officials was large and most of the distributing firms had meetings of Northwestern representatives to hear these men talk on trade topics. Optimism which pervades all lines of business and industry in this part of the country was repeatedly expressed.

This year 232 exhibitors displayed 355

automobiles, the closed body type prevailing, although a few open cars with permanent tops were shown. Almost invariably the dealers took larger space than previously because of the great variety of body styles turned out this year and because of expectation that improved financial conditions will result in good sales this season.

Springfield, Illinois, Holds Its Seventh Annual Exhibit

SPRINGFIELD, Ill., Feb. 8.—The seventh annual show of the Springfield Auto Dealers' Association opened Jan. 28 and continued four days. The state arsenal, rented for the occasion, never presented a more attractive appearance. W. C. Henry was in charge and arranged some novel and artistic effects. The architectural arrangement was in terra cotta. There were Arabian striped awnings of buff, with spearhead supports, resting upon large tan tinted flower urns. It was desired to carry out the Spanish mission effect as much as possible. The overhead decorations mingled the national colors with silk lamps. Sixteen firms were represented with automobiles, while 12 firms exhibited accessories. Trucks were barred because of lack of room. An orchestra furnished music during the week. A new attendance record was set as the show lasted one more day than in former years. The opening day was designated as "Dealers' Day" and a large number of out-of-town tradesmen came in by an invitation to see the display and enjoy the hospitality of the Springfield firms.

Doors of Show at Toledo Closed Upon Large Throngs

Hundreds Turned Away at Entrance of Car and Accessory Exhibit on Big Day

TOLEDO, Feb. 6.—Automobile dealers who have exhibits at the seventeenth annual automobile show here this week are convinced from sales and the number of prospects found that 1925 is to be an excellent year for business and the best in several years.

Despite rather bad weather the attendance at the show the first three days exceeded 30,000 and on Thursday evening there was such a jam that the doors had to be closed and hundreds turned away.

There are 140 passenger cars on exhibition, 30 trucks and 32 accessory booths. This is the largest number of cars ever placed in the building in the many years that it has housed the show.

This is the first year in Toledo that closed cars have dominated the entire motor show. And the public is evidently catching onto that idea too, for dealers report far more interest in the closed models than they have ever noted before.

Motor Club Buys Fleet of Roadsters for First Aid Work

CHICAGO, Feb. 9.—The Chicago Motor Club has swung into service for the first aid road work a fleet of 16 roadsters which in time will retire most of the club's motorcycles that have been used heretofore in meeting the emergency calls of its members.

The chassis of the new first aid car is the Model T3 of the Yellow Cab Manufacturing Co., on which is mounted a specially designed body by H. McFarlane & Co. of Chicago. The wheelbase was made six inches longer than the standard Model T3, giving it a length of 115 inches. The car is equipped with a winch and cable for pulling stranded automobiles while it carries a specially designed generator and oversized battery to start machines with cold engines or run down batteries. With this equipment officials of the club believe they will be able to render their members much improved service.

In the future it is announced that the service department's policy will be to tow any member to any garage he may designate within reasonable distance. In the past the practice has been to tow the stranded car only to the nearest club service station.

BREWSTER JOINS SCHUTTE

LANCASTER, Pa., Feb. 9.—Henry Brewster, who is well known in the automotive industry through his connections with Brewster & Co., coach builders, and the automobile body division of the Pullman Co., has joined Charles Schutte Body Co. and is in charge of the drafting department as designer and engineer.

New Vehicle for Light Hauling



A new single purpose vehicle designed and built by Lee Oldfield and Chas. Rowson of Chicago, to handle the loads now carried by a single horse and wagon. This vehicle is gasoline driven and according to the builders can be operated in large cities at a total overall cost of less than half that of a horse and wagon. The list price is \$750 and deliveries will start in April

December Registrations Exceed November in Indiana-Illinois

Hoosier State Total Shows 92 Per Cent Increase with 8 for Western Neighbor

CHICAGO, Feb. 7.—Total registrations of new passenger cars in Indiana for 1924 were 99,944, which compares with 111,034 in 1923, or a loss of 10 per cent. In Illinois the total for 1924 was 166,454 as against 164,251 the preceding year, a gain of 1 per cent for 1924. Total registrations in Illinois for December gained 8 per cent over November, but in Indiana the increase was more pronounced. The 6,048 new December registrations compare with 3,137 the month before, an increase of 92 per cent. Fords advanced sharply in Indiana, the total for December being 3,299 as against 1,569 for November.

The total of 733 high-priced cars in Illinois for December includes 259 cars of miscellaneous make not listed by name; for November the number of miscellaneous cars was only 30. In Indiana the number of miscellaneous cars for December was one, while for November it was two.

Following are the detailed figures for the 12 months of 1924:

ILLINOIS						
		Low,	Excl.	Med.	High	
Month	Fords	Fords	Price	Price*	Price*	Total
Jan.	4,101	2,187	5,871	1,013	13,172	
Feb.	3,201	1,724	3,762	567	9,254	
March	5,798	2,396	4,761	690	13,645	
April	12,461	4,805	8,073	964	26,303	
May	10,779	4,234	7,151	862	23,026	
June	6,626	2,539	4,675	503	14,343	
July	9,014	3,428	6,774	787	20,003	
Aug.	6,647	2,363	5,227	541	14,778	
Sept.	4,867	1,586	3,580	453	10,486	
Oct.	4,199	1,307	3,555	546	9,607	
Nov.	2,417	760	2,186	303	5,666	
Dec.	2,191	753	2,494	733	6,171	
Total ..	72,301	28,082	58,109	7,962	166,454	

*Including miscellaneous cars not named.

INDIANA						
		Low,	Excl.	Med.	High	
Month	Fords	Fords	Price	Price*	Price*	Total
Jan.	4,100	1,007	1,259	104	6,476	
Feb.	4,748	1,353	1,743	121	7,965	
March	6,664	2,054	2,688	215	11,621	
April	8,126	2,760	3,449	198	14,533	
May	6,423	2,295	2,880	174	11,772	
June	4,542	1,548	2,220	159	8,469	
July	4,191	1,470	2,308	139	8,108	
Aug.	5,036	1,692	2,457	127	6,312	
Sept.	3,514	1,022	1,802	99	6,537	
Oct.	3,022	867	1,967	110	5,966	
Nov.	1,569	459	1,040	69	3,137	
Dec.	3,299	894	1,718	137	6,048	
Total ..	55,240	17,421	25,631	1,652	99,944	

*Including miscellaneous cars not named.

The foregoing statistics were compiled from data furnished to Motor Age by Robinson's Advertising Service, Springfield, Ill., and Indianapolis Auto Trade Association, Indianapolis, Ind.

FOLBERTH BUILDS

CLEVELAND, Feb. 7.—A new plant unit of the Folberth Auto Specialty Co.

Steam Cooled and Steam Heated Cars Promised As Likely Development of Near Future

By DONALD BLANCHARD

DETROIT, Feb. 7.—Steam-cooled and steam-heated cars are an extremely probable development of the near future. One of the industry's largest producers has been experimenting with steam cooling for some time past and similar research work has been going on in other quarters. It is understood that the results obtained in these investigations have been so satisfactory as to warrant the early adoption of this method of cooling, and that the only real obstacle in its way is the hesitancy felt by some executives in making the change from the traditional water-cooled system.

As a part of this work the practicability of steam-heating the interior of the car was also investigated. Small sections of radiator core were mounted in the driver's compartment and tonneau and a portion of the steam developed in the cylinder jackets diverted to them. These experiments indicate that the idea is workable and that the results obtained compare favorably with any present method of heating car interiors.

As a result of the experimental work that has been done to date it is stated that steam cooling introduces no complications nor are any radical changes necessary in present engine designs. The only thing needed which is not on the water-cooled car with pump circulation is a steam dome, and this may be mounted on the cylinder block or incorporated with the radiator. A positive type of pump is said not to be necessary as the system will function satisfactorily with a well-designed single-stage centrifugal unit. The external appearance of the car would not be affected in any way by the change to steam cooling.

Detonation has been advanced frequently as an objection to steam cooling, it being held that the higher temperatures would be more likely to induce "pinging." In answer to this it is stated that if an engine does not develop detonation troubles when operated with water cooling no fuel knocks will be encountered when a change is made to steam cooling. In other words, if detonation develops the fault lies with the design of the block and head jackets or with the position of the spark plug, and not with the method of cooling. No more trouble is experienced with points of localized high-wall temperature than in the water-cooled job. In this connection it is asserted that the function of the pump is simply to deliver the condensate from the bottom of the radiator to the cylinder jackets, no forced circulation of the cooling medium being required due to the turbulence created by the boiling action.

No troubles are encountered in winter due to the evaporation of the anti-freeze material. The vent connection is at the bottom of the radiator and, as the condensation is complete at this point, there is no vapor present and consequently no loss of anti-freeze material. When anti-freeze material is used the operating temperature of the system naturally is reduced in proportion to the amount used.

has been erected at Lake avenue and West Eightieth street at a cost of \$100,000. The structure is two stories high, of mill type construction with steel columns and beams.

Huffman Brothers Motor Co. Making 6-Cyl. Passenger Cars

ELKHART, Ind., Feb. 6.—The Huffman Brother Motor Co. is now manufacturing the Huffman Six passenger automobile in five body styles. These are: A roadster at \$1,395, a touring car at \$1,395, a sport touring car at \$1,495, a three passenger cabriolet at \$1,695, and a sedan at \$2,295.

The engine is an 8-R six-cylinder Continental with 3½ in. bore and 4½ in. stroke. The clutch is a Borg and Beck. Lubrication is by force feed and splash. The wheel base is 120 ins. Semi-elliptic springs are used, those in front being 37 in. long and those in the rear 56 in. long.

The Huffman Co. also announces two new trucks, model E 1½ ton at \$1,790, and the model BH 2-ton worm drive at \$1,990.

JOHN C. WIDMAN DIES

DETROIT, Feb. 7.—John C. Widman, former president of the J. C. Widman Body Co., which was merged in the new Murray Body Corp., died at Palm Beach, Fla., recently, the body being brought to Detroit for burial. Mr. Widman was 75 years old and has been active in Detroit business circles continuously since 1865, retiring about a year ago because of ill health.

TO PUSH MERCHANDISING

SPENCER, Ia., Feb. 7.—At a sales conference this week, the W. T. Thomas Mfg. Co. announced the completion of aggressive plans for merchandising the Bull Dog Foot Accelerator and the Bull Dog Three Way Carburetor control for Fords.

JEWETT PRICES ADVANCED

NEW YORK, Feb. 9.—Announcement has been received here that the Paige-Detroit Motor Co. has advanced the price of Jewett cars an average of \$30 for each model, effective Feb. 15.

Looking Back Eight Years Upon First Show in San Francisco Where Golden Gate's Greatest Exhibit Soon Holds Forth



This is a view of the first automobile show held in 'Frisco Feb. 10-18, 1917.

SAN FRANCISCO, Feb. 9.—Automobile dealers and others connected with the industry from many coast and western points will gather in San Francisco Feb. 21-28 for the ninth annual Pacific Automobile Show. The great display will be held in the Exposition Auditorium. Featuring show season will be a number of especially interesting conferences and events at which conditions in the trade and prospects for business in 1925 will be discussed.

The show promises to surpass any similar event ever held here from standpoints of splendor and completeness. Decoration plans are more elaborate than any previously attempted, incorporating a number of ideas gleaned by George Wahlgreen, show manager, during visits

recently to European exhibits. The 1925 San Francisco show will be held under the auspices of the Motor Car Dealers' Association, of this city, which was behind its eight predecessors.

San Francisco's first automobile show was held Feb. 10-18, 1917. George Wahlgreen was the manager then, as he is today, and the show was held in the Exposition Auditorium, as it is now. Two hundred cars were shown in this first show by 39 exhibitors. It is interesting to note that 46 exhibitors of passenger cars alone, showed more than 300 cars in the 1924 show, seven years later. The lowest priced car in the 1917 show was \$400, and the highest \$12,000, while the value of all the exhibits—passenger cars, trucks and equipment—was placed at

\$1,000,000. The exhibition covered 40,000 square feet of floor space and admission then, as now, was 50 cents. February 15, "Society Night," was the big night of the first show.

Officials of the Motor Car Dealers Association responsible for this first show were President, J. A. Marsh; vice president, Chester N. Weaver; secretary, Thomas A. Skinner; assistant secretary, A. F. Lemberger; treasurer, Frank O. Renstrom. The executive committee, which had direct supervision over the show, was composed of W. L. Hughson, chairman; J. J. Morse, D. A. Urquhart, J. H. Eagal, and F. L. DuBray. Mr. Hughson was chairman, also, of the executive committee which had charge of the 1924 show.

Year Gets Off With Good Business Stride

(Continued from page 32)

In the East the severe January weather has affected sales. Figures for the New York City territory show sales running about 1,000 behind those of January a year ago. This is attributed to the heavy snows and unfavorable weather generally in all parts of New York State. Prosperity prevails and money is plentiful. As the weather grows better sales are likely to be on a greatly increased scale.

Philadelphia reports that new car sales improved substantially over those of December, with a small increase over the corresponding month of last year. Sales prospects in the rural districts have improved.

Reports from the South are mixed. Louisville reports passenger car sales in January as only fair, affected by ad-

verse weather conditions and the proximity of the automobile show, booked for Feb. 16-21.

Birmingham reports that since Jan. 1 there has been a gain in business reported by all dealers of low and medium priced cars, while the dealers in higher priced cars have not been so fortunate. Used cars there have been moving fairly well. A much larger demand for new and used cars is anticipated for early spring.

New Orleans reports as follows: "Some dealers started off the new year rather dull, but the business picked up the latter part of the month. Conditions here are bright as to prospects."

Dallas reports that Texas new car sales in January were 15 per cent under those of December. Medium priced

vehicles are the favorites there. Dealers are not overstocked. Used car sales decreased 10 per cent. The tire and accessory trade slowed up. Garage business improved 10 per cent. The outlook in all lines is promising in Texas.

In New England conditions are about the same as in the New York section. In the national capital dealers are gratified over the interest shown in the new models and expect 1925 to be one of their best years.

Toledo reports an increase in orders for January; Cleveland sales on a level with January of last year and excess of those in December, while Cincinnati's statement is to the effect that new car sales could be rated as good, used car sales as fair and that prospects are bright.

Permanent Equipment Mart to Be Launched by A. M. A.

Big Project Meets Unanimous Approval of Members and Will Be Started at Once

CHICAGO, Feb. 7.—Marking what is generally agreed to be the most progressive step ever taken by the organization, members of the Automotive Manufacturers' Association last night unanimously endorsed a plan calling for establishment of a great central showroom and sales place for the association's equipment producers. The new institution is to be known as The Automotive Equipment Mart and, according to speakers at last night's meeting, it will be the only establishment of its kind in the automotive field.

Plans for the mart have been going quietly ahead for the past several months so that when the project was put before the members for formal approval nothing toward consummation remained to be done except details essential to the mart's actual beginning. An option has been obtained on quarters at South Michigan avenue and Thirteenth street. Under the option the association may take one floor in the beginning and add other floors later on as needs require.

The plot for the initial floor provides for 46 exhibit spaces, which it is expected will be subscribed in a short time. The next floor will be swung into use just as soon as 50 additional spaces beyond those on the original floor have been contracted for. It was ventured that all would be in readiness for the mart's operation by March 1.

High-Power Salesman on Job

Member manufacturers will be privileged to use their exhibit spaces for display and demonstration purposes under liberal conditions designed to give each producer in the mart all advantages of a private sample room. The manufacturer may have a representative in charge of his display if he desires and he may bring his customers to the mart at any time. To provide for his representation there at all times, however, arrangements will be made for employment of a high-power sales executive who will show all products displayed and who will be authorized by the association to make sales on the spot in conformity with instructions and specifications of the various exhibitors. The big idea is to speed up sales of member manufacturers by the centralized arrangement. The jobber or other buyer who often spends weeks in going from city to city to inspect equipments and place orders would be able to make a wide canvass of such offerings under one roof, giving him at any time of the year advantages that are found at a regular equipment show, along with many other helps that it is planned to work out.

The association, of which W. E. Green is secretary, will maintain much larger offices than it now occupies and be prepared to furnish stenographic help, han-

dle mail and telegrams and attend to numerous matters for the convenience of exhibitors. The floor plan provides for a conference room which will be used for sales conferences or other meetings desired. There will be a smaller conference room where salesmen from the factories or the mart's own salesman can interview buyers.

All of the exhibit spaces are well located so that there is little preferential distinction between them. The booths average about 90 square feet in area and will cost the exhibitor \$4 per square foot per year. It was emphasized that the mart is not to be conducted for association profit. The space rate was calculated to permit a charge which is estimated to be less than 10 per cent of what it would cost for the same facilities independently and only a moderate amount of any surplus will be set aside as a contingency reserve. There is to be a board of control two-thirds of which will be exhibitors, and there will be a management committee under the board which will have immediate supervision of all activities connected with the operation of the enterprise. The co-operative salesroom will be advertised constantly in leading publications as a means of attracting to it the attention of equipment buyers. The expense of the advertising campaign as well as all other mart expenses will be carried by the mart, rather than the association, the idea being to make the mart fully self-sustaining.

Membership Drive

Tied up with the equipment mart undertaking will be a big membership drive which the association will continue from the present time to April 1. It is believed that the advantages of the mart, alone, should be a sufficient inducement to draw many more manufacturers into the organization.

Added importance to the association's much enlarged credit information service will also come with the opening of the mart. Factory representatives who receive buyers at the mart will be able in most instances to get a full line on a buyer's responsibility by stepping into the association's central offices.

Friday night's meeting was designated as Howard E. Patterson Night in honor of the association's former president and one of its most conspicuous workers. As a token of the membership's esteem for Mr. Patterson he was presented with a fine radio set made up of parts manufactured by members of the A. M. A. Mrs. Patterson, who attended the meeting as a specially invited guest, was presented with a bunch of American beauty roses. Harry Schleining of the William R. Johnston Co. spoke briefly on "Why the Jobber Did Not Make a Profit in 1924" and "How Can Jobber Profits Be Assured in 1925." He will be heard again at a later meeting when there will be sufficient time for him to go into the subject thoroughly and for round table discussion.

Better Sales Than Last Year Reported at Pittsburgh Show

Many Persons Wait Outside for Others to Leave So They Can View Displays

PITTSBURGH, Feb. 9.—The Pittsburgh show, insofar as attendance is concerned, was one of the most successful ever held in this city. Motor Square Garden, where the annual display has been held for several years, was jammed every night of the seven that the show lasted, many persons being compelled to wait outside for a half hour or more until enough people had left before they could gain admittance.

Dealers report that sales were somewhat better than last year. Trading ran about 75 per cent closed models and the largest number of cars shown on the floor was of the closed type.

The show closed Saturday night, Feb. 7.

While the show was held in Motor Square Garden, contract for the pavilion was closed only a week or two before the show opened. The dealers' organization was wrought up over excessive demands by the management and there was a movement to hold the show in Duquesne Garden. Matters were adjusted, however, and the show put on according to schedule.

There are a number of dealers here of considerable standing who did not exhibit at the show, some staging individual events.

Four New Body Designs Are Announced by Studebaker

SOUTH BEND, Ind., Feb. 9.—Studebaker has announced four new body types as follows: Coach \$1,295, standard six brougham \$1,465, special six brougham \$1,795, special six roadster \$1,535—all prices f. o. b. factories.

The coach and the standard six brougham are on the standard six chassis, while the special six brougham and roadster are on the special six chassis. The coach has two doors. The standard six brougham was produced for those wishing a closed body with four doors, between the coach and sedan in price and design. There are four wide doors on the special six brougham. The new roadster offers a number of distinctive accessories and accoutrements. All of the new models offer such features as wiring in metal conduits; valve for draining crankcase without getting under car or soiling hands; oil returns to crankcase through removable screen; gasoline tank protected by heavy steel apron on which combination rear and stop light is mounted. Instruments under oval glass include clock, ammeter, oil pressure gage, speedometer and gasoline gage. Production on the new models was begun Feb. 1.

171,355 New Cars Delivered By Michigan Trade in 1924

Gain Made in December for State at Large Despite Loss Registered for Detroit

DETROIT, Feb. 9.—Retail deliveries of new cars in Michigan for 1924 totaled 171,355, the December total being 8,552, an increase over the previous December, which totaled 6156. The gain in the state for December was in spite of a loss in Detroit, whose totals for the month were 2,915, December, 1924, as against 3,227, December, 1923.

Ford sales during the year totaled 87,896, slightly more than 50 per cent of the year's total. The sales total of Ford and other low priced fours was 116,745. Sales of cars in the \$1,000 price class exclusively totaled 21,961. Sales of medium priced six-cylinder cars totaled 28,440. High priced cars totaled in sales 4,209. Cars other than those by 30 leading makers sold a total of 1,769 during the year.

Truck sales for the year in the state were 16,163, December showing sales of 936 as against 598 in the same month in 1923. The Ford truck total for the year was 10,637, December with 586 deliveries showing a gain of about 200 over the previous year.

APPOINT SALES MANAGER

NEW YORK, Feb. 7.—Johns-Manville, Inc., announces appointment of Granville P. Rogers as sales manager of its general automotive equipment department with headquarters in this city. Mr. Rogers for several years was general sales and advertising manager of the Pyrene Manufacturing Co. of Newark, N. J., and also vice-president, general sales and advertising manager of Kant Rust Products Corp. of Rahway, N. J. He also has been active in the work of the Automotive Equipment Association and vice-chairman of its membership committee. He is a member of the New York Sales Managers Club and the New York Advertising Club. He is well known in the automotive equipment industry.

Ring Up New Year's Record of \$1,300,000 in Used Car Sales

LOS ANGELES, Feb. 7.—Despite the fact that 1924 was regarded by many dealers as unsatisfactory from the standpoint of used car merchandising the local branch of Don Lee, Cadillac distributors, reports the year as the largest in the history of its used car department.

According to an announcement the total volume of used car sales during the year was in excess of \$1,300,000. This was larger than the previous high mark made in 1923 by more than \$100,000. The year was closed with sales in excess of \$50,000 in the last week.

Must Have Got His Money's Worth

BUFFALO, N. Y., Feb. 8.—On Saturday, the last day of the Buffalo Automobile Show, there was delivered to Carlton Proctor, Show Manager, an envelope addressed "Buffalo Automobile Show, 174th Armory," which contained a coin carrier holding two quarters. Across the face of the coin carrier had been written "admission." It is believed that someone "crashed the gate," and after seeing the show, considered it was well worth the price of admission.

Passenger Car Casualty Rates Modified Somewhat in Manual

NEW YORK, Feb. 9.—Completely revised schedules of public liability and property damage rates for commercial cars is contained in the 1925 automobile casualty manual which has become effective. Whereas last year the private passenger car rates were thoroughly overhauled, this year the emphasis of revision is placed on the trucks, although it has been found necessary to modify some of the property damage rates on private passenger cars as well.

Commenting on the 1925 manual, Jesse S. Philips, general manager of the National Bureau of Casualty & Surety Underwriters said:

"The extensive statistics on commercial cars which were available for rate making purposes showed first, that the existing property damage rates were inadequate, and second, that the rates for heavy and light trucks were much too close together for both the public liability and property damage coverages. For private passenger cars, the experience shows that the present level of public liability rates is adequate. But the property damage experience has not been favorable, and increases are required in certain territories. In establishing rates for 1925, the automotive governing committee adhered to the principle of basing rates for individual cities on their individual experience wherever the data were of dependable volume."

AFTER MORE STANDARDIZATION

WASHINGTON, Feb. 7.—Citing the example of the automotive industry in the standardization of spark plugs, piston rings and brake linings, benefiting 15,000,000 automobile owners, the U. S. Chamber of Commerce is preparing to urge a general house-cleaning in other lines still loaded with duplications and excessive varieties. It is announced the crane manufacturers are the latest converts, they having found they have too many types and sizes for which they are spending good money wastefully.

California Sales in January Under Same Month Year Ago

Rumors of Proposed Laws Hitting Owner's Purse Partly Blamed for Buyers' Hesitancy

SAN FRANCISCO, Cal., Feb. 9.—Automobile sales conditions in California are still in a slump, with January sales showing a decline from January, 1924, of from 10 to 15 per cent. Several factors enter into the determination of the bad state of the market, with the California legislature heading the list. The lawmakers are in session and there are rumors of drastic laws to be considered by them for the purpose of procuring revenue and which will be aimed at the motor car owners.

A heretofore unnoticed portion of the state vehicle act has been causing considerable trouble for the motor car dealers since the first of the year. The law states that all motor cars must be registered as models of the year in which they were actually turned out by the factory. This portion was inserted by the insurance men to save them trouble in searching through records when insuring a car but has been a boomerang to the dealers. Efforts are being made by the dealers to have the legislature remove this portion of the act.

OPEN EXPORT OFFICE

DETROIT, Feb. 9.—The Motor Wheel Corp. has opened an export office in New York City under the direction of C. O. Brandes, who for the last seven years has handled the export department of the Firestone Tire & Rubber Co.

Extension of the company's efforts to the export field follows extensive development of replacement business in the United States. In the last two years the company has named 71 distributors of its wheels and service parts throughout the United States.

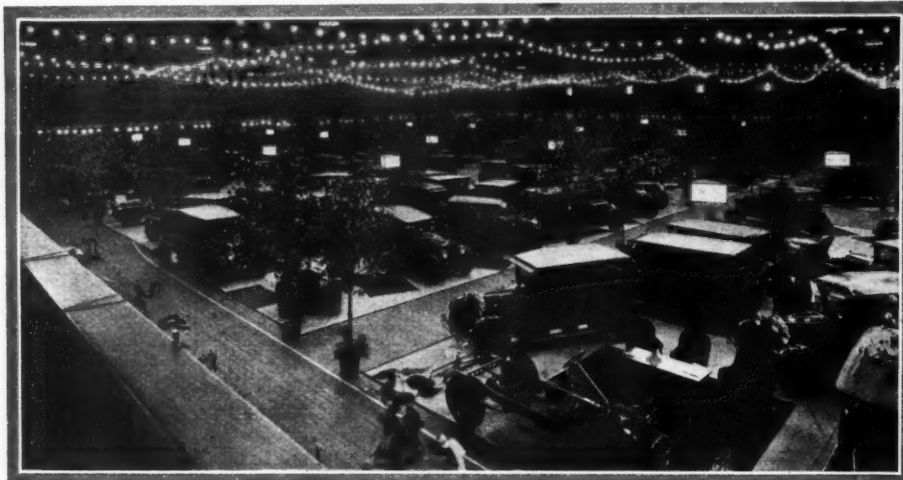
By April 1 it plans to have a distributor warehouse and service for repairing and servicing wheels in every city with a population in excess of 25,000.

California Claims Largest Investment in Motor Vehicles

SACRAMENTO, Cal., Feb. 9.—Although it appears that New York still holds first place in the number of motor vehicles owned, California is laying claim to having the largest investment in automobiles of any state in the Union.

It is pointed out that New York has a registration of 1,400,470 cars, while California shows 1,321,480. Due to the greater distance from the factories and the consequent freight charge, automobiles cost about 10 per cent more in California than in New York. If 10 per cent is added to California's figures, the amount held to be fair due to the greater cost here, California would have the equivalent of 1,453,628 cars.

Photographic Glimpse of Successful Motor Car Exhibit Staged by Buffalo Dealers Jan. 10-17



Over 30,000 New Cars Sold in St. Louis Field Last Year

ST. LOUIS, Mo., Feb. 9.—More than 30,000 new automobiles were sold in the city of St. Louis and St. Louis County during 1924. These cars had an approximate retail value of \$32,000,000.

In addition there were more than 700 new trucks sold during the year in the same territory.

Buyers seemed to have a tendency to take the lower priced machines as there were more than 17,000 cars sold at a price of \$1,000 or less. There were 6,500 cars sold at prices ranging from \$1,000 to \$3,000 and 534 cars sold in the \$3,000 to \$5,000 class and 62 at a price of \$5,000 or more.

Seventy-four makes of automobiles and taxicabs divided the passenger car business while there were 24 varieties of trucks sold.

ERECTING PLANT ADDITION

FOND DU LAC, Wis., Feb. 7.—The Longdin-Brugger Co. of Fond du Lac, which now concentrates on the manufacture of the "Close-Tite" all-weather body for Fords, is erecting an addition to its plant to handle increasing business, which extends to foreign countries. A new department also is being established to fabricate all the glass used in curtains, and special machinery for grinding the material has been purchased.

FRANCHISED BY CHANDLER

CLEVELAND, O., Feb. 9.—The Chandler Motor Co. has appointed new dealers as follows:

Funk & Ennis, Baltimore, Md.; Burdett F. Engert, Danville, N. Y.; Mott & Frasier, Glen Falls, N. Y.; Peerless Garage, Sunbury, Pa.; Renshaw Motor Co., Wilkes-Barre, Pa.

FORD STATES SHOALS POSITION

DETROIT, Feb. 9.—In an authorized statement issued here, Henry Ford repeated his previously announced stand that he no longer is interested in taking over Muscle Shoals. He added that he is willing to co-operate with the government in the development of Muscle Shoals into a nitrate plant, making cheap fertilizer for the American farmers. He added: "If the government keeps Muscle Shoals and operates the nitrate plant for the army and navy, I shall be glad to put at their service all that the Ford Co. has of knowledge and experience. The Ford Co. will turn over to the government without cost the results of its research."

More Automobiles, But Fewer Deaths at Railroad Crossing

WASHINGTON, Feb. 9.—Despite the increase of approximately 20 per cent in the number of automobiles in use, 131 fewer lives were lost in grade crossing accidents from June 1, 1924, to Oct. 1, than in the similar period of 1923, the American Railway Association has just revealed here.

The decrease in accidents was brought about by a safety campaign conducted by the railroads, it is claimed.

The total of fatalities at grade crossings during this period was 738, compared to 869 for the period ending in 1923, a decrease of 15 per cent. Persons injured during that period in 1924 totaled 2,191, compared to 2,173 in 1923.

From January 1, 1924, to October 1, nine months, 1,537 persons were killed at grade crossings, a decrease of 76, compared to the corresponding period in 1923. Persons injured totaled 4,547, compared to 4,472 during the first nine months of 1923.

Ford Adds 6,000,000 Square Feet of Industrial Space

Much Important Construction Completed by Company Recently and More Nearly Finished

DETROIT, Feb. 7.—Going into the new year Ford Motor Co. has a total of 20,500,000 square feet of industrial space under roof, 6,000,000 square feet or about 40 per cent being added in the year recently closed. A large part of the additional space is made up of new assembly and manufacturing buildings under construction or just completed at 10 of the branch properties.

Three assembly plants were built or are nearing completion at points where there were formerly no assembly facilities. These are at Jacksonville, Fla., Norfolk, Va., and Charlotte, N. C. New plants were built or are nearing completion at Memphis, Tenn., Dallas, Tex., and Louisville, Ky. An addition was made to the branch at Oklahoma City to permit building of bodies and a new sales and service building was added at Salt Lake City. This building program was carried out in conformity with a new policy of standardizing of assembly plants making equipment interchangeable.

Among New Industries

Chief of the new industries established were the wood distillation plant at Iron Mountain, Mich., and the cement plant at River Rouge. The expansion program at River Rouge adds 1,700,000 feet of floor space. A large addition was made to the wheel plant at Hamilton, O.

Through improvements in industrial methods the company will save 32,500 tons of steel yearly and 100,000,000 board feet of lumber, due in both cases to improved cutting and in the latter also to improved lumbering practice. Power developments during the year included completion of hydro electric plants at St. Paul and Iron Mountain, and the completion of plans for a small unit at Ypsilanti.

Expansion in foreign countries included the establishment of branches at Santiago, Chile, Rotterdam, Holland, and Stockholm, Sweden.

PRICE JOINS BENDIX

CHICAGO, Feb. 9.—J. L. Price, formerly vice-president and treasurer of the Chicago Pneumatic Tool Company is now vice-president and general manager of the newly organized Bendix Corporation, Chicago, and president and general manager of the Bendix Brake Company, South Bend, Ind., a subsidiary of the Bendix Corporation.

BUILDING NEW HOME

HOUSTON, Tex., Feb. 9.—The Dow Motor Company of Houston, Texas, one of the Ford distributors, is erecting a new home. The new building will cover a quarter of a block, be three stories high and will cost more than \$100,000.

Gasoline Tax Adopted by Thirty-Six States of Union

Measure Is Before Several of Remaining Commonwealths as
Live Issue

RUTLAND, Vt., Feb. 9.—A bulletin issued by the Vermont State Chamber of Commerce on its gasoline tax report shows that 36 states throughout the country have adopted the gasoline tax. In some of the 12 remaining states the issue is alive.

According to the bulletin, one state has a four-cent tax, nine states have a three-cent tax, two have a two and a half-cent tax, while 17 have a tax of one cent.

Seven states increased the tax in one year from one to three cents, as follows: Arizona, Arkansas, Florida, Georgia, North Carolina, Kentucky and Mississippi. Oklahoma advanced the rate from one cent to two and a half cents and Virginia, when the state first adopted the tax, adopted the three-cent rate.

The people of Minnesota on Nov. 4, 1924, indorsed the principle that gasoline tax proceeds shall be "all for roads," through the passing of a constitutional amendment providing that all the income from the proposed gasoline tax be placed in the state trunk highway fund. At the same time Missouri adopted a two-cent tax and doubled the license fee. Earlier in the year Congress passed a law for a two-cent gas tax for the District of Columbia.

In Kansas, Iowa and Nebraska three strong organizations are working for great road programs to be financed in part through the proposed gasoline tax. In New York and New Jersey special committees will report to the legislature of 1925, making recommendations as to automobile tax legislation with the gasoline tax proposition the main issue.

In Wisconsin the State Farm Bureau Federation conducted a referendum on the gasoline tax question, and more than 84 per cent of the votes were favorable to the tax. In Michigan the state Grange resolved "That if the legislature should fail to pass such a gasoline law the state Grange would immediately initiate such a measure."

APPOINTED BY OAKLAND

PONTIAC, Mich., Feb. 9.—Announcement has been made by the Oakland Motor Car Company of the appointment of Bell Brothers as dealers in Philadelphia and the metropolitan area. Previously this territory was served by a factory branch. The show rooms and offices of the dealers will be in the Brown and Broad street building. Before going to Philadelphia to take charge of the Oakland branch there Bell Brothers had charge of Oakland sales in Brooklyn and Queens Borough, New York. Officials of the company are: President, James A. Bell; vice-president, E. J. Bell; secretary, Arthur R. Bell.

Schools to Teach Merchandising

DETROIT, Feb. 7.—Institution of merchandising schools for the benefit of its dealers has been started by the Oakland Motor Car Co., the first school being in operation at the factory, with others to follow in important cities in the near future. W. M. Chamberlin, in charge of sales development work for the company, will direct the schools.

In addition to this active work among dealers, the sales development department will handle such fundamentals as territorial analysis to determine sales possibilities, the duties of a modern retail sales manager, special selling campaigns and fleet business and how to get it. Used car campaigns and a variety of similar developments will be undertaken.

The department has already worked out plans for better use of window and showroom displays which are being put into effect by many Oakland dealers.

Minimum Car Operation Cost 7½ Cents a Mile, Says Bell

WASHINGTON, Feb. 9.—In a recent appropriation hearing before Congress Engineer Commissioner J. Franklin Bell here said the records of his department showed that the minimum cost at which a passenger automobile may be operated is 7½ cents a mile. This includes gasoline, oil, tires, repairs, labor and materials. It was brought out that in many instances the records showed that the cost of operation will go up to 15 or 20 cents a mile.

STATE FLINT SALES MANAGER

MILWAUKEE, Feb. 9.—T. L. Dugan has been appointed manager of the Wisconsin Flint Co., Milwaukee, state distributor of the Flint Six. E. W. Martin, who established the Milwaukee concern as a branch of the Chicago Flint Co. several months ago, has returned to Chicago to resume charge of sales.

DISTRIBUTE LINCOLN

KNOXVILLE, Tenn., Feb. 9.—Knoxville Lincoln Sales and Service, Inc., is the name of a new firm organized at Knoxville as distributors of the Lincoln line in that section of the state. The company has a capital of \$25,000, incorporators including C. M. Cooley, Harvey G. Fowler, and others.

Southeast Is Promised Better February Trade Than January

Best Buying of Year Expected From
Rural Districts Following Good
Crop Prices

ATLANTA, Ga., Feb. 9.—Distributors in Atlanta advise that January sales in the Georgia and southeastern territory were fairly good, but that inclement weather which was general throughout this section seriously interfered with business. As a whole, January sales appear to have been about on a par with the corresponding month last year, but distributors state that the February outlook gives promise of a 10 to 15 per cent improvement over that month in 1924.

Retail sales in the larger cities like Atlanta, Savannah, Macon, etc., are proportionately better at this time than in the smaller communities for the first time in some months, though this condition is not expected to prevail for long as the primary buyers this year are expected to be the rural population because of the excellent profits realized off last years' crops. Ford dealers are looking for the best business during the coming springs months they have ever experienced.

Accessory jobbers report continued active demand from retailers in all parts of the southeast, with indications of a heavy demand for accessories and parts from now until summer.

The outlook for tractor business this spring is the best it has been in some years.

GIVEN VICE-PRESIDENCY

LOUISVILLE, Ky., Feb. 9.—Election of William O. Protsman as vice-president of the Leyman-Buick Company, operating automobile agencies in Louisville, Cincinnati and Dayton, Ohio, has been announced. His headquarters will be in Cincinnati.

Mr. Protsman has been manager of the Leyman-Buick Company here since July 1, 1917. He is first vice-president of the Louisville Automobile Dealers' Association and has been a director since 1919.

As senior executive officer of the Leyman organization, Mr. Protsman will direct the activities of the three agencies.

SELL MOTOR WHEEL SHARES

NEW YORK, Feb. 7.—Motor Wheel Corp. common stock to the amount of 50,000 shares was offered and sold here at \$15.50 a share by Charles D. Barney & Co. and Otis & Co. According to the bankers, the average sales in 1923 and 1924 were \$20,000,000. For 1924 the net income totaled approximately \$1,600,000, equivalent to \$3.26 on the 490,891 shares. The bankers stated that the management intends to fix the next quarterly dividend, payable March 20, at 30 cents a share, thus placing the stock on a \$1.20 annual basis.

More Dealer Events Than Ever Held in Detroit Show Season

Gatherings Attended by Factory Executives Who Outline Selling Programs in Contemplation

DETROIT, Feb. 7.—More show week meetings were held by manufacturers for dealers during the Detroit show week than during any previous show held here. Among those holding meetings were Studebaker, Willys-Overland, Maxwell-Chrysler, Paige-Jewett, Chevrolet, Oldsmobile, Nash and Hudson-Essex. Prominent factory executives from each of the factories attended to outline selling possibilities in the new year and to confer with dealers on factory co-operation.

The Chevrolet meeting was the biggest of the week, the company showing motion pictures of the mechanical features of its new line and putting its sales promotion plans at an afternoon session and holding a dinner meeting in the evening. Speakers included R. H. Grant, vice-president and sales manager; R. K. White, sales promotion manager; A. R. Kroh, sales promotion department; C. E. Dawson, assistant sales manager, and A. F. Young, sales manager for the Michigan zone.

Appointment Announced

At the Paige-Jewett dinner S. D. Bolton was announced as the new general manager of the Detroit distribution headquarters of the company. Mr. Bolton was formerly northern Michigan distributor at Saginaw. Speakers were H. M. Jewett, president of the company; Henry Krohn vice-president in charge of sales; G. C. Mather, chief engineer; S. E. Jamisen, service director, and Walter K. Towers, advertising manager.

George S. Motrow, new manager of the Detroit Oldsmobile branch, succeeding W. J. Clemons, was introduced to the Olds dealer organization at a show week meeting and dinner. Mr. Clemons is to be Pacific Coast representative of the company. Speakers at the meeting were Mr. Motrow, Mr. Clemons, Guy H. Peasley, general sales manager of Olds Motor Works, Leon Dodge, assistant sales manager, and E. J. Shassberger, advertising manager.

The Willys-Overland meeting was addressed by John Willys and L. G. Peed, general sales manager. C. W. Nash addressed the Nash meeting. The Hudson-Essex meeting was held at the factory and was followed by visitors to the Detroit show and to the meeting of the Michigan Automotive Trade Association, which also was held during the week.

PEERLESS NAMES DEALERS

CLEVELAND, O., Feb. 9.—The Peerless Motor Car Co. announces the following dealers:

Weaver Sales Company, Lockport, N. Y.; Sebring & Runner, Corning, N. Y.; F. H. Atwood, Cairo, Ill.; Harmon Graves Motor Company, Eureka, Cal.

View of Automobile Show Held Recently in Detroit Where Decorations Surpassed All Previous Efforts



PREDICTS GOOD YEAR

ST. LOUIS, Mo., Feb. 7.—Henry Krohn, vice-president and general manager of the Paige-Detroit Motor Car Co., was a speaker at a luncheon of Paige and Jewett dealers in the St. Louis district arranged by the Wilson Motor Car Co., which took over the distribution of Paige and Jewett cars here recently. Mr. Krohn said it is his opinion that 1925 gives promise of being an unusually profitable year in all lines of business and especially in the automobile industry. He gave his reasons for this declaration, the clearing up of the foreign situation, the excellent crops in the farming districts and the healthy condition of bank deposits.

OLDSMOBILE PRICES

LANSING, Mich., Feb. 9.—Olds Motor Works announces its official list of Oldsmobile prices, effective Jan. 2, 1925, as follows: Standard touring, \$890; standard roadster, \$890; sport roadster, \$985; sport touring, \$1,095; business coupe, \$1,045; coach, \$1,075; coupe for four, \$1,175; standard sedan, \$1,285; de luxe sedan, \$1,375. These prices are f. o. b. Lansing, with balloon tires standard on all models. The company states that it has not built a delivery body, as previously reported, and does not intend to do so at the present time.

BIG RADIO BATTERY DEMAND

MADISON, Wis., Feb. 9.—The Burgess Battery Co., Madison, Wis., manufacturer of dry batteries, has been compelled to make immediate enlargement of its plant to handle the heavy increase in orders for radio batteries. The concern has awarded contracts for the construction of a one-story extension, 62x252 ft., which will cost about \$75,000, with equipment, and be ready about May 15 or June 1.

New Oakland Distributing Firm Formed at Louisville

LOUISVILLE, Ky., Feb. 9.—The Oakland is to be distributed in Louisville and surrounding territory by the W. A. Thomas Automotive Company. The new firm is composed of W. A. Thomas, L. M. Sattley and R. M. Gregory.

This marks the reuniting in business of two men who have been prominently connected in Louisville automobile circles for the past 16 years, Mr. Thomas being one of the founders of the Louisville Automobile Dealers' Association and its vice president since its inception. Mr. Sattley was one of the pioneers of the Oakland car in Louisville. Mr. Gregory comes to the organization with many years of factory sales promotion work with the Oakland and other large automobile factories.

NEW HEADLIGHT RULE

SACRAMENTO, Cal., Feb. 9.—Automobiles equipped with headlights which obtain their electricity from magneto, will not be allowed to operate on the highways of California after March 1, according to Will H. Marsh, chief of the division of motor vehicles. Mr. Marsh says it is impossible for a magneto equipped car to meet the maximum and minimum light requirements of the California headlight law.

The decision affects several thousand old-type cars still in use. The owners of these cars must either equip them with batteries or install acetylene gas lights.

NAMED FRANKLIN DIRECTOR

SYRACUSE, N. Y., Feb. 7.—At the annual meeting of the H. H. Franklin Manufacturing Co., Arthur E. Parsons was elected a director to succeed John Wilkinson, resigned.

With the Associations

Committees Appointed

ST. LOUIS, Mo., Feb. 9.—A Service Committee has been added to the executive organization of the St. Louis Automobile Dealers Ass'n. The members appointed by President F. C. McDonald are: Frank Tate, Dodge Brothers, distributor; R. C. Frampton, president of the Hudson-Frampton Co., and George Weber, president of the Weber Implement and Automobile Co., Hupmobile distributors.

It is the purpose of the committee to call a monthly meeting of St. Louis service managers with a view to discussing service problems and methods for solving them.

The members of the Legislation Committee appointed by McDonald are: Phillip H. Brockman, H. L. Schnure, of the Schnure-Buick Co., E. A. Hatfield, president of the Mississippi Valley Motor Co., Oakland distributor, Edward Weber, president of the Weber Motor Car Co., Studebaker distributor, and H. F. Fahrekrog, who recently formed a dealer partnership with William Schneider to handle Reo. He had been connected with the Kardell Co. for many years.

Wallerich to Wield Gavel

INDIANAPOLIS, Feb. 9.—At the annual meeting of the Indianapolis Automobile Trade Association C. H. Wallerich, Dodge Brothers, was elected president; J. S. McFarland, Oldsmobile, vice-president; John A. Boyd, Maxwell and Chrysler, treasurer; and A. W. Hutchison, Franklin and Detroit Electric, secretary. The Board of Directors is composed of Geo. M. Kanouse, Velle; Frank D. Hatfield, Ford; R. V. Law, Hudson and Essex; R. H. Losey, Nash; and Geo. O. Wildhack, Chevrolet, and the above officers.

The annual Spring Automobile Show will be held the week of March 2-7, in the Automobile Building at the State Fair Grounds. It was decided to eliminate dealers special tickets which have in the past been sold in books to dealers at a

special discount. No tickets will be printed in the future except the regular admission ticket, to be sold at 50 cents, and a ticket for use of the press.

On Friday night, Feb. 27, the association will give an entertainment and dinner for the benefit of Indianapolis automotive salesmen. At this meeting W. B. Burruss, sales consultant of the National Automobile Dealers' Association, will deliver an address.

Bus Owners Organize

FORT WORTH, Tex., Feb. 9.—The Texas Motorbus Owners Association was formed at a meeting of bus operators from all sections of the state. H. A. Pate, owner of the Fort Worth-Alvarado-Hillsboro-Waco bus line was elected president.

The Association favors placing the motorbus lines under the supervision of the Railroad Commission and will work to have a law passed which will accomplish this end.

Some of the features of the bill sponsored by the bus operators are licensing operators, forcing owners to carry insurance to protect passengers in case of accidents, franchises for use of the highways, regulation of speed and fares, examination and licensing of individual drivers and installation and maintenance of equipment.

Choose New Secretary

ST. LOUIS, Mo.—At a recent meeting of the Associated Tire Dealers of St. Louis nearly all old officers were re-elected. Thomas F. Carpenter, of the Carpenter Tire Co., was elected secretary. Harry F. Schollmeyer had been secretary last year but refused re-election because he was unable to devote the necessary time to the office. This was the only change.

The number of directors was increased from five to twelve.

Schooler Again at Helm

DES MOINES, Ia., Feb. 9.—Dean Schooler was reelected president of the Des Moines Automobile Dealers' Association, at its annual meeting this week and other officers are: Vice-president, W. W. Sears, treasurer, C. L. Herring; secretary, C. G. Van Vliet. G. A. Peverill has been named director to succeed George W. Jones, who has gone to the west coast; Mr. Van Vliet was named director for the one year term and George Means and Don Laster for the two year terms.

Northampton Dealers Meet

NORTHAMPTON, Feb. 7.—The Northampton Dealers' Association held a meeting at which were present dealers representing organizations at Holyoke, Pittsfield, Greenfield, Westfield, Springfield, Adams and Boston. There were several interesting addresses by men from the various associations on trade conditions throughout New England.

Adopt Golden Rule

CALGARY, Feb. 7.—The Alberta Garagemen's Association which was in existence some three years ago has been revived. Leading garagemen throughout the Province of Alberta are solidly behind the organization and to date the membership runs upward of 150. The standards of service set up in principles adopted by the organization includes the Golden Rule.

Hold Bureau Election

ST. LOUIS, Mo., Feb. 7.—At a recent meeting of the Commercial Car Bureau of the St. Louis Automobile Dealers' Ass'n. officers for 1925 were chosen. They are: Chairman, A. S. Johnson, of the General Motors Truck Co.; vice-chairman, George S. Stevens, of the Diamond T Co.; Secretary, Robert E. Lee. Mr. Lee is manager of the Automobile Dealers' Assn.

UNDER NEW FIRM NAME

WASHINGTON, Feb. 9.—The name of the District Oakland Co. here has been changed to that of Wallace Motor Co., E. M. Wallace, president. There is no change in personnel of the company and it will still continue to handle the Oakland automobile at its present address, 1709 L street, northwest.

The company as originally formed in May, 1917, to handle the Oakland line of automobiles in this territory. In January, 1922, Mr. Wallace purchased a half interest in the business and eighteen months later he bought out the interest of R. J. Murphy, his partner. Since that time he has been the sole owner of the

business and it was with the idea of identifying his own personality a little closer with his business that the change in name was made.

PAY \$25,000 FOR BUILDING

OSHKOSH, Wis., Feb. 7.—The Winnebago Auto Co., Oshkosh, Wis., Ford and Lincoln dealer, has purchased for \$25,000 the automotive building at 261-263 Main street, now occupied by the Bogdad Chevrolet Co., and will establish an exclusive Lincoln sales and service department. The original building will be used exclusively for Ford and Fordson sales and service.

FLINT BRANCH OPENED

SPRINGFIELD, Mass., Feb. 7.—The Flint Motor Co. has opened a direct factory branch at 1095 State street. D. P. Larkin, for some time Eastern district sales manager for the company, is in charge. A complete line of parts and accessories has been installed and the service work is to be done by factory-trained men.

DISTRIBUTE JORDAN

BLOOMINGTON, Ill., Feb. 7.—Jordan Company has been organized in that city to distribute the Jordan line in central Illinois. L. H. Merritt, late of Dwight, Ill., is president and general manager.

Coming Motor Events

Automobile Shows

Adams, Mass. Feb. 12-14 Adams-North Adams Automobile Show, Adams State Armory, J. J. Callahan, Pittsfield, Mass., manager.	Great Falls, Mont. March 3-7 Tenth Annual Silver Jubilee Automobile Show, auspices Montana Automobile Dealers' Ass'n, L. E. Jones, secretary.	Racine, Wis. Feb. 21-24 Second Annual Show, Automotive Dealers Ass'n, John Wilkenson, Mgr.
Albany, N. Y. Feb. 21-28 Annual Automobile Show, State Armory, under the auspices of the Albany Automobile Dealers' Association, L. B. Wood and L. Y. Long, managers.	Hartford, Conn. Feb. 21-28 Eighteenth Annual Passenger Car Show, Hartford Automobile dealers' Ass'n, Arthur Fifoot, manager.	Saginaw, Mich. March 3-7 Annual Automobile Show, Saginaw Auditorium, under the auspices of the Saginaw Automobile Dealers Association, R. P. Bishop, manager.
Allentown, Pa. March 1-8 Allentown Automobile Show, under the auspices of the Lehigh Automobile Trade Association, E. T. Satchell, president.	Indianapolis, Ind. Mar. 2-7 Annual Automobile and Accessory Show, Automobile Bldg., Indianapolis Automobile Trade Assn., John Orman, Manager.	San Francisco Feb. 21-28 Ninth Annual Pacific Automobile Show, Exposition Auditorium, under auspices Motor Car Dealers' Association of San Francisco, G. A. Wahlgreen, Manager.
Atlanta, Ga. Feb. 14-21 Passenger Car and Accessory Show, City Auditorium. Atlanta Automobile Ass'n.	Johnstown, Pa. Feb. 26-Mar. 7 Annual Automobile Show, Johnstown Automobile Dealers' Ass'n, H. Swank, Mgr.	Schenectady, N. Y. Feb. 16-21 Automobile Show, Schenectady Automotive Dealers' Ass'n, J. T. Henley, secretary.
Boston March 7-14 Annual Show, Boston Automobile Dealers' Association, Chester I. Campbell, manager.	Kansas City, Mo. Feb. 7-14 Kansas City Motor Car Dealers' Association Show.	Springfield, Mass. Feb. 9-14 Annual Automobile Show, Municipal Auditorium, auspices Springfield Automobile Dealers Association, Harry W. Stacy, manager.
Charlotte, N. C. Feb. 9-14 Fifth Annual Carolina Automobile Show, B. D. Heath, Chairman Central Committee.	Louisville, Ky. Feb. 16-21 Louisville Automobile Show, Louisville Automobile Dealers Association, George T. Holmes, manager.	St. Louis, Mo. Feb. 28-Mar. 7 Annual Automobile Show, St. Louis Automobile Dealers Association, Robert E. Lee, manager.
Deadwood, S. C. Feb. 23-28 Annual Automobile Show, auspices Deadwood Business Men's Club, Ray Ewing, Mgr.	Mankato, Minn. Feb. 17-20 Annual Automobile Show, State Armory, under the auspices of the Mankato Automobile Dealers Association, E. T. Dillner, manager.	Trenton, N. J. Feb. 18-21 Automobile Show, Armory, Harry C. Woods, Mgr.
Denver Feb. 24-28 Annual Automobile Show, Denver Auditorium, auspices Denver Automobile Dealers Association, T. D. Braden, manager.	Moline, Ill. Mar. 5-7 Automobile Show, local dealers, Berglung Building, R. C. Jasper, Chairman.	Troy, N. Y. Feb. 28-March 7 Annual Automobile Show, under the auspices of the Troy Automobile Dealers Association, State Armory, Frank M. Baucus, manager.
Des Moines, Ia. Feb. 22-28 Annual Automobile Show Under Auspices of Des Moines Automobile Dealers Association.	Muskegon, Mich. Feb. 16-21 Muskegon Automobile Show, Muskegon Automobile Trade Association, J. C. Fowler, manager.	Uniontown, Pa. Feb. 10-14 Annual Automobile Show, Capitol Motor Co., auspices Uniontown Automobile Ass'n.
Evansville, Ind. March 4-7 Automobile and accessory show, Independent Auto Dealers' Association, Chas. Leggett, Jr., secretary.	Omaha, Neb. Feb. 16-21, 1925 Twentieth Annual Omaha Automobile Show.	Worcester, Mass. Feb. 9-14 Annual Automobile Show, Worcester Automotive Association, W. R. Livingstone, manager.
Evansville, Ind. Mar. 9-15 Annual Automobile Show, Evansville Automobile Show Association.	Peoria, Ill. Feb. 23-28 Annual Show, Peoria Automobile and Accessory Dealers' Ass'n, C. W. Coons, 2112 Lehmann Bldg., Mgr.	Yonkers, N. Y. March 2-7 Seventh Annual Automobile Show of Yonkers Automobile Merchants Association, auspices Military Company, J. J. Callahan, Pittsfield, Mass., director.
Fort Worth, Tex. March 3-10 Third annual passenger car show, Fort Worth Auto Trades Ass'n Bldg.	Port Jarvis, N. Y. Feb. 23-27 Second Annual Automobile Show, Case Bldg., Port Jarvis Automobile Dealers' Ass'n, F. S. Nicholson, president.	
Grand Rapids, Mich. Feb. 9-14 Annual Automobile Show, Passenger Car Dealers Association, M. D. Elgin, manager.	Portland, Me. Feb. 23-28 Annual Automobile Show, Portland Automobile Dealers' Ass'n, Howard B. Chandler, Mgr.	
	Providence, R. I. Feb. 7-14 Annual Automobile Show, State Armory, auspices Rhode Island Automobile Dealers Association, Chester I. Campbell, Boston, manager.	

Races

Los Angeles, Cal. Feb. 22

APPERSON TO STEP UP

KOKOMO, Ind., Feb. 9.—The Apperson Automobile Co. will start immediately on a much heavier production schedule, according to a factory announcement. The company has been operating on a low schedule, it is said, due to inability to obtain certain materials. The factory force is to be increased at once. Apperson officials look for one of the biggest seasons in the organization's 30 years' history.

CITY HELPS STAGE SHOW

MILWAUKEE, Wis., Feb. 9.—A notable example of civic co-operation with the automotive trade to make possible a local show was the action of the board of education of Sheboygan, Wis., in giving the local dealers the privilege of using the gymnasium of the new \$1,500,000 high school for four days. There is no other suitable building in Sheboygan and no

complete automotive exposition was held until this year. The dealers are organized as the automotive division of the Sheboygan Association of Commerce, which induced the school board to set aside the large gymnasium from Thursday until Sunday night, Jan. 29-Feb. 1. Fifty-one cars were displayed, not including the large number of equipment exhibits. The total attendance reached 6,150 and a total of seventy-seven actual car sales were reported.

TO DEMONSTRATE MACHINE TOOLS

CHICAGO, Feb. 9.—An exhibition of machine tools in operation will be held during the week of March 2 in the show rooms of the Marshall & Huschart Machinery Co., 17 S. Jefferson St., Chicago. Products of about 25 manufacturers of machine tools, many of which are used in the automotive industry, will be demonstrated.

YOEMAN LEAVES CONTINENTAL

DETROIT, Feb. 7.—The resignation of George W. Yoeman as a vice president of Continental Motors Corp. was announced following a meeting of the board of directors here this week at which formal action on the resignation was taken. Mr. Yoeman has been connected with Continental Motors for the past 16 years, joining the company as manager of parts sales in 1909 and rising through many executive positions to a vice presidency.

In accepting the resignation the board of directors adopted resolutions of regret and Mr. Yoeman was given an engraved watch as a token of the esteem of his fellow directors and officers. It is Mr. Yoeman's intention to take a vacation for a short time following which he will re-engage in business the nature of which will be announced later. The vice presidency made vacant by the resignation will not be filled for the present.

New Motor Vehicles Last Year Cost World \$3,360,000,000

Increase in Car Registration During 1924 Amounts to 2,750,000 Units.

WASHINGTON, Feb. 9.—With the United States leading with 62.5 per cent of the world's total automobiles and motor trucks in 1924, the entire world spent \$3,360,000,000 for new motor vehicles last year, according to the automotive division of the Department of Commerce.

On Jan. 1 it is estimated there were in operation in all countries 18,615,000 passenger cars, 2,892,000 trucks and 1,262,000 motorcycles. The total of these three classes of motor vehicles was 22,769,000 which brought an increase for the year over the total reported Jan. 1, 1924, of 18 per cent or 3,479,000 vehicles. Of this total increase this country accounted for 2,427,000 or 70 per cent.

The department official statement said:

"Returns from trade agents throughout the world indicate that during the past year there were assimilated 3,300,000 passenger cars and trucks, and 200,000 motorcycles, which total number at the conservative figure of \$1,000 average retail value for the cars and trucks, and \$300 for motorcycles, enabled the department's approximation.

2,750,000 Car Increase

"There was an increase of 2,750,000 in passenger cars and approximately 550,000 in trucks during 1924. Motorcycles also pushed more into widespread use as revealed by the numerical increase of 180,000 over the base registration of 1,075,000 at the beginning of 1924 but this increase was mostly in foreign countries.

"The United States now has 84 per cent of all passenger cars, 74 per cent of all trucks and 11 per cent of all motorcycles in the world.

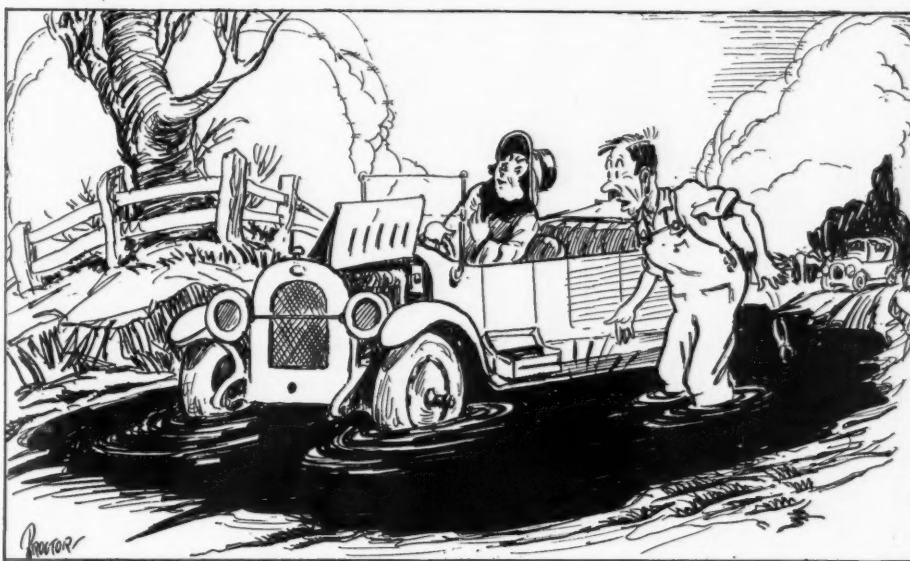
"As America's motor vehicle manufacturers give more attention to markets outside the confines of the United States, it is interesting to point out some of the countries which have exhibited the greatest registration strength during the past year. In most cases these new and larger fields are the result of greater export activity by American firms.

"Combining passenger cars and trucks, France and the United Kingdom, with gains of well over 100,000 each, lead all other countries toward complete motorization. Numerically they are followed by Australia, Germany, Canada, Argentina, Italy, Sweden and New Zealand. In fact, it might be said that almost every market of any consequence could be included in this group of forward marchers."

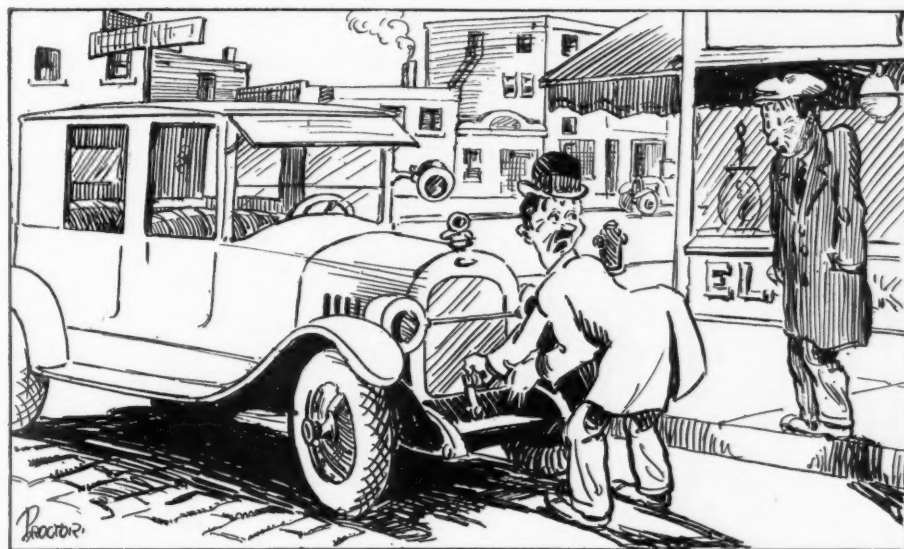
REPRESENT AUBURN

MILWAUKEE, Feb. 9.—The Barth Auburn Co., Milwaukee, has been incorporated with 500 no-par shares to take

SQUEEKS and RATTLES



Mechanic: "I can't find anything wrong, madam.
She: "Well, you haven't been underneath yet!"



Passerby: "Whasamatter, starter on the blink?
Motorist: "Naw, I'm just shaking down the ashes!"

over the local representation of the Auburn. Karl P. Barth is president; D. R. Gray, vice-president; P. S. Redford, vice-president and general manager; Robert J. Barth, secretary-treasurer. The headquarters are at 461-463 Broadway.

DISTRIBUTORS CAPITALIZE

KINGSTON, N. C., Feb. 7.—Formation at Kingston, recently, of the Knight-Overland Co., with \$25,000 capital, to distribute the Willys-Knight and Overland line, has been announced. Incorporators named are Courtney Mitchell, R. J. Dawson, and others.

CHEVROLET DEALERS ELECT

ST. LOUIS, Mo., Feb. 7.—New officers of the St. Louis Chevrolet Dealers' Association, recently elected are: President, Frank E. Flint, Flint Motor Car Co., vice-president, Harold K. MacCarthy MacCarthy-Pardue Motor Co., secretary-treasurer, Phillip P. Fox, Wells Motor Co. Directors of the association are: Norman DeVoy, Orthewin Motor Corporation, Dudley M. Hewette, Big Four Auto Co., and C. W. Pfrimmer, South Side Chevrolet Co.

Prices and Weights of Current Passenger Car Models

SHIP.	WT.	PASS.	BODY STYLE	PRICE
AMERICAN				
2985	2-p		"D-66"	\$1,950
3175	4-p		Sp. Roadster	2,050
3260	5-p		Touring	1,695
3300	5-p		Sport	1,850
3310	7-p		Touring	1,760
3190	4-p		Sp. Touring	1,885
2470	7-p		Sedan	2,550
3310	5-p		Brougham	2,195
ANDERSON				
2650	5-p		"41"	\$1,195
2675	4-p		Sp. Touring	1,445
2925	2-p		Coupe	1,425
2875	5-p		Sedan	1,695
2925	5-p		Sp. Sedan	1,895
2975	7-p		Touring	1,595
3200	7-p		Sedan	1,945
APPERSON				
8100	5-p		Phaeton	1,395
8100	5-p		Sp. Phaeton	\$1,695
8145	3-p		Coupe	1,985
8470	5-p		Sp. Sedan	2,295
3815	5-p		Phaeton	\$2,485
3900	7-p		Phaeton	2,535
3955	5-p		Sport Phaeton	2,800
3815	7-p		Sport Phaeton	2,900
4180	5-p		Sedan	3,485
4200	7-p		Sedan	3,585
4340	5-p		Sport Sedan	3,750
4380	7-p		Sport Sedan	3,850
-----	5-p		Sp. Phaeton	\$2,550
-----	3-p		Coupe	2,800
-----	5-p		Brougham	2,800
-----	5-p		Sedan	2,850
AUBURN				
-----	5-p		Touring	795
2610	5-p		Special Touring	\$1,395
2900	5-p		English Coach	1,945
2885	5-p		Sedan	1,595
3225	5-p		Sp. Touring	1,895
3550	5-p		Sedan	2,550
3510	5-p		Brougham	2,395
3550	7-p		Sedan	2,550
-----	4-p		Sport Roadster	1,975
-----	4-p		Club Roadster	2,075
-----	4-p		Sport Brougham	2,250
-----	5-p		Sedan	2,350
BARLEY				
2750	5-p		"6" 6-50	\$1,395
2800	5-p		Touring	1,495
3100	5-p		Sp. Touring	1,850
3150	5-p		Sedan	2,250
BUICK				
2750	2-p		Roadster	\$1,150
2800	2-p		Roadster Encl.	1,190
2920	5-p		Touring	1,175
2970	5-p		Touring Encl.	1,250
2960	2-p		Coupe	1,375
3075	4-p		Coupe	1,565
3185	5-p		Dbl. Service Sedan	1,475
3245	5-p		Sedan	1,665
3050	5-p		Coach	1,295
"Master"				
3285	2-p		(120 in. W. B.) Roadster	\$1,365
3385	2-p		Roadster Encl.	1,400
3465	5-p		Touring	1,395
3540	5-p		Touring Encl.	1,475
3770	4-p		Coupe	2,125
3850	5-p		Sedan	2,225
3560	5-p		Coach	1,495
(128 in. W. B.)				
3485	3-p		Sp. Roadster	\$1,750
3550	5-p		Sp. Touring	1,800
3610	7-p		Touring	1,625
3690	7-p		Touring Encl.	1,700
3745	3-p		Country Club	2,075
3905	5-p		Brougham Sedan	2,350
4080	7-p		Limousine	2,525
3995	7-p		Sedan	2,425
3850	7-p		Town Car	2,925
CADILLAC				
4190	4-p		Roadster	\$3,185
4280	7-p		Touring	3,185
4200	4-p		Phaeton	3,185
-----	5-p		Coach	3,185
4610	7-p		Sedan	3,585
4380	4-p		Victoria	3,275
4525	4-p		Landau	3,650
4655	7-p		Std. Imperial	4,010
"Custom Built"				
4260	2-p		(132 in.) Coupe	3,975
4400	5-p		(138 in.) Coupe	4,350
4490	5-p		Sedan	4,550
4590	7-p		Suburban	4,650
4655	7-p		Imp. Suburban	4,950
CASE				
3260	3-p		J. I. C. Roadster	\$1,840
3290	5-p		Touring	1,885

SHIP.	WT.	PASS.	BODY STYLE	PRICE
3470	5-p		Sp. Touring	2,160
3570	4-p		Sub. Coupe	2,480
3640	5-p		Sedan	2,590
3650	5-p		Brougham	2,590
"X"				
3020	3-p		Roadster	\$1,670
3050	5-p		Touring	1,695
3380	5-p		Sub. Coupe	2,390
3400	5-p		Sedan	2,485
3380	5-p		Victoria	2,390
"Y"				
3950	7-p		Touring	2,475
4320	7-p		Sedan	3,325
CHANDLER				
3090	2-p		Roadster	\$1,795
3182	4-p		Roadster	1,785
3084	5-p		Touring	1,595
3223	7-p		Touring	1,735
3284	4-p		Royal Dispatch	1,885
3309	5-p		Coach	1,595
3309	5-p		Chummy Sedan	2,045
3469	5-p		Met. Sedan	2,195
3428	5-p		Sedan	1,995
3521	7-p		Sedan	2,195
3598	7-p		Limousine	3,095
CHEVROLET				
1690	2-p		"Superior" Roadster	\$525
1790	5-p		Touring	525
1955	5-p		Phaeton De Luxe	640
2005	4-p		Coupe	725
1880	2-p		Utility Coupe	715
-----	5-p		Coach	735
2070	5-p		Sedan	825
CHRYSLER				
2805	4-p		(112 1/2 in. W. B.) Roadster	\$1,625
2730	5-p		Touring	1,395
2785	5-p		Phaeton	1,495
2935	4-p		Coupe	1,895
3060	5-p		Sedan	1,825
3085	5-p		Imperial Sedan	2,065
3090	5-p		Crown Sedan	2,195
3995	5-p		Brougham	1,965
3225	5-p		(118 1/2 in. W. B.) Town Car	3,725
CLEVELAND				
-----	5-p		Touring	895
-----	5-p		Sedan	1,195
2750	5-p		Touring	\$1,095
2810	5-p		Touring De Luxe	1,195
2830	3-p		Coupe	1,295
2870	3-p		Spec. Coupe	1,395
3040	5-p		Spec. Sedan 4 d.	1,495
3190	5-p		Sedan De Luxe	1,695
3190	5-p		Sport Sedan	1,725
2990	5-p		Brougham	1,545
2990	5-p		Coach	1,295
COLE				
3675	4-p		"MASTER" Volante Tour.	\$2,325
3795	7-p		West. Tour.	2,325
3675	4-p		Aero-Vol. Tour.	2,475
4055	5-p		Bouquet Sedan	3,225
4000	7-p		Royal Sedan	3,225
4100	7-p		Royal Limousine	3,325
CUNNINGHAM				
4600	7-p		"V 6" Touring	\$6,300
4500	4-p		Sp. Touring	5,800
4700	4-p		Coupe	7,150
5000	5-p		Sedan	7,650
DAGMAR				
3800	4-p		"6-70" Sp. Touring	\$3,500
4200	4-p		Petite Coupe	4,500
3700	4-p		Phaeton	3,500
3750	4-p		Roadster	3,500
3800	6-p		Tourer	3,500
4200	4-p		Petite Sedan	4,500
4500	4-p		De Luxe Coupe	4,750
4700	5-p		Sedan	4,700
4800	7-p		Sedan	4,750
3100	2-p		Roadster	1,785
3200	4-p		Sp. Touring	1,785
3150	5-p		Touring	1,985
3400	2-p		Coupe	2,345
3500	5-p		Sedan	2,345
DANIELS				
4150	4-p		"24-38" Touring	\$6,800
4765	7-p		Touring	6,900
4600	4-p		Sedan	7,600
5200	7-p		Sedan	7,800
DAVIS				
2650	4-p		M. o' War Road.	\$1,495
2915	4-p		Legionnaire Tour.	1,495
2750	5-p		Phaeton	1,395
3070	5-p		Sedan	1,995
3065	5-p		Berline Sedan	1,995
2700	5-p		Brougham	1,595
2835	4-p		Roadster	1,795
3020	5-p		Phaeton	1,695
3245	5-p		Sedan	2,295
3050	5-p		Brougham	1,895
3215	5-p		Berline Sedan	2,295

SHIP.	WT.	PASS.	BODY STYLE	PRICE
DODGE BROTHERS				
2475	2-p		Roadster	\$855
2593	2-p		Special Roadster	955
2567	5-p		Touring	885
2695	5-p		Spec. Touring	985
2708	2-p		Coupe "B"	995
2823	2-p		Spec. Coupe "B"	1,095
2813	4-p		Coupe	1,375
2901	4-p		Spec. Coupe	1,475
2995	5-p		"B" Sedan	1,095
3077	5-p		Spec. "B" Sedan	1,195
3020	5-p		Sedan A	1,245
3107	5-p		Spec. "A" Sedan	1,330
2725	5-p		Coach	1,095
2865	5-p		Spec. Coach	1,195
DORRIS				
4120	4-p		Pasadena Tour.	\$4,150
4115	7-p		Touring	4,150
4198	4-p		Coupe	4,985
4200	5-p		Sedan	5,550
4310	7-p		Sedan	5,800
DUESENBERG				
3920	3-p		Straight "8" Roadster	\$6,500
3700	5-p		Phaeton	6,250
3920	7-p		Phaeton	6,750
3980	4-p		Sp. Phaeton	6,500
4000	4-p		Coupe	7,500
4350	7-p		Sedan	7,800
DU PONT				
3300	2-p		Roadster	\$2,600
3400	5-p		Touring	2,600
3600	5-p		Touring Sedan	3,400
3600	5-p		Suburban Sedan	2,750
DURANT				
2235	2-p		Roadster	\$1,080
2325	5-p		Touring	830
2345	5-p		Touring F. W. B.	940
2405	2-p		Business Coupe	935
2495	4-p		Coupe	1,160
2605	5-p		Sedan	1,190
2550	5-p		Coach	1,050
ELCAR				
2560	5-p		"4-40-41" Touring	\$995
2585	5-p		Demi Sp. Touring	1,095
2641	5-p		Sportster	1,195
2779	5-p		Sedan 3 d.	1,295
2900	5-p		Sedan	1,495
2779	5-p		Brougham 3d	1,265
2600	5-p		"6-50-51" Demi Sp. Tour.	1,220
2779	5-p		Sedan 3 d.	1,495
2900	5-p		Sedan	1,720
2779	5-p		Brougham	1,490
2007	5-p		"6-61" Touring	1,585
3380	5-p		Sedan	2,245
3675	5-p		Sp. Sedan	2,395
3380	4-p		Brougham	1,995
3000	3-p		"8-80" Roadster	2,315
3700	5-p		Sp. Touring	2,165
-----	7-p		Sp. Touring	2,265
4000	5-p		Brougham	2,865
4050	7-p		Sedan	2,765
ESSEX				
2130	5-p		Touring	\$900
2305	5-p		Coach	895
FLINT				
3095	3-p		Sp. Roadster	\$1,630
-----	3-p		Spec. Roadster	1,950
3245	5-p		Touring	1,595

Prices and Weights of Current Passenger Car Models

SHIP.
WT. PASS. BODY STYLE PRICE

LOCOMOBILE "48"			
5030	4-p	Sportif Tour.	\$7,400
5330	7-p	Touring	7,400
5600	5-p	Victoria Sedan	\$9,900
5464	7-p	Brougham	9,990
5640	7-p	Tour. Limousine	9,000
5868	7-p	Encl. Drive Lim.	9,990
5624	7-p	Cabriolet	10,250

-----	5-p	J-6 Touring	1,600
-----	5-p	Sedan	2,000
-----	5-p	Brougham	2,100

-----	5-p	J-3 Touring	1,785
-----	5-p	Sedan	2,185
-----	5-p	Brougham	2,285

McFARLAN	"6" TV		
4600	2-p	Roadster	\$5,400
4600	4-p	Sport Touring	5,600
4700	7-p	Touring	5,700
4900	4-p	Coupe	6,720
5200	4-p	Tour. Sedan	6,720
5200	7-p	Tour. Sedan	6,810
5200	7-p	Sp. Sedan	6,600
5200	7-p	Sub. Sedan	7,000
5100	7-p	Limousine	6,900
5200	7-p	Town Car	9,000

-----	3-p	"Light 6" SV Roadster	2,600
3700	3-p	Touring	2,600
3850	4-p	Coupe	3,100
3850	5-p	Sedan	3,100
3850	7-p	Sedan	3,200

MARMON	"74"		
3470	2-p	Roadster	\$3,165
3666	5-p	Phaeton	3,165
3766	7-p	Touring	3,165
3861	5-p	Brougham Coupe	3,295
-----	3-p	Coupe de Luxe	3,455
3981	5-p	Sedan	3,295
3921	5-p	Sedan de Luxe	3,775
-----	7-p	Sedan	3,370
4036	7-p	Sedan de Luxe	3,850
4000	5-p	Sedan Limousine	3,900
4100	7-p	Sedan Limousine	3,975

MAXWELL	"25"		
2210	5-p	Touring	\$895
2255	2-p	Club Coupe	995
2440	5-p	Club Sedan	1,045
2580	5-p	Sedan	1,095
2595	5-p	Spec. Sedan	1,245

MERCER	"6"		
-----	5-p	Touring	\$4,500
-----	5-p	Sedan	6,200

MOON	Series "A"		
-----	3-p	Roadster	\$1,250
2440	5-p	Roadster	1,295
2460	5-p	Sp. Touring	1,195
2605	5-p	Sedan 2d	1,595
2755	5-p	Petite Sedan 4 d.	1,785

-----	2760	5-p	Newport Touring	1,495
2920	5-p	Sedan	1,815	
3090	5-p	Petite Sedan	1,915	
<hr/>				
MOON			Series "A"	
-----	2440	3-p	Roadster	\$1,25
	2440	5-p	Roadster	1,29
	2460	5-p	Sp. Touring	1,19
				xx

2605	5-p	Sedan 2d	1,59
2755	5-p	Petite Sedan 4 d.	1,78
		Newport	
2760	5-p	Touring	1,49
2920	5-p	Sedan	1,81

3090	5-p	Petite Sedan	1,91
		Metropolitan	
2860	5-p	Touring	1,51
3120	5-p	Sedan	1,99
3100	5-p	Sp. Sedan	2,00

NASH	"Special"		
2870	2-p	Roadster	1,095
2960	5-p	Touring	\$1,095
3120	5-p	Sedan	1,225

2870	2-p	Roadster	1.09
2960	5-p	Touring	\$1.09
3120	5-p	Sedan	1.22
"Advanced"			
(121 in. W. B.)			

3320	8-p	Roadster	1,37
3400	5-p	Touring	1,37
3556	5-p	Sedan 2 d.	1,4
3680	5-p	Sedan	1,6

OAKLAND	"6-54"		
2420	3-p	Roadster	\$1,095
2510	3-p	Sp. Roadster	1,195
2485	5-p	Touring	1,095
2550	5-p	Sp. Touring	1,195
2745	5-p	Coach	1,215
2620	3-p	Landau Coupe	1,295
2720	4-p	Coupe	1,495
2860	5-p	Sedan	1,545
2885	5-p	Landau Sedan	1,645

OLDSMOBILE "30"			
2145	2-p	Roadster	\$890
2270	2-p	Sp. Roadster	985
2390	5-p	Touring	890
2380	5-p	Sp. Touring	1,015
2350	5-p	Bus. Coupe	1,045
2460	4-p	Coupe	1,175
2410	5-p	Coach	1,075
2370	5-p	Sedan	1,285
2740	5-p	DeLuxe Sedan	1,375

SHIP.
WT. PASS. BODY STYLE PRICE

OVERLAND "91"			
1769	2-p	(100 in. W. B.) Roadster	\$495
1863	5-p	Touring	495
2177	2-p	Coupe	635
2130	5-p	Sedan	715
2004	5-p	Coupe Sedan	585

-----	2044	5-p	(106 in. W. B.) Blue Bird "6"	725
-----	-----	5-p	Sta. Sedan	985
-----	-----	5-p	Sedan De Luxe	1,150

PACKARD	"6"		
3165	4-p	(126 in. W. B.) Roadster	\$2,785
3320	5-p	Touring	2,585
3255	4-p	Sp. Touring	2,750
3400	4-p	Coupe	2,585
3515	5-p	Coupe	2,685
3565	5-p	Sedan	2,585
3610	5-p	Sedan Limousine	2,785

3255	4-p	Sp. Touring	2,750
3400	4-p	Coupe	2,585
3515	5-p	Coupe	2,685
3565	5-p	Sedan	2,585
3610	5-p	Sedan Limousine	2,785

3610	5-p	Sedan Limousine	2,785
		(133 in. W. B.)	
3480	7-p	Touring	2,785
3690	7-p	Sedan	2,785
3765	7-p	Sedan Limousine	2,885

(136 in. W. B.)				
3880	4-p	Runabout	3,850	
3990	5-p	Touring	3,650	
3930	4-p	Sp. Touring	3,800	

PAIGE	"21-24"		
3915	4-p	Phaeton	\$2,165
3960	7-p	Phaeton	2,165
4135	5-p	Brougham 4 d.	2,395
4415	7-p	Sedan DeLuxe	2,840
4460	7-p	Sub. Limousine	2,965

PEERLESS	"6-70"		
3050	2-p	Roadster	\$2,350
3175	5-p	Touring	2,235
3350	7-p	Touring	2,485
3525	5-p	Coupe	2,495
3550	5-p	Sedan	2,565
3725	7-p	Sedan	2,765
3825	7-p	Limousine	2,925

3915	4-p	Phaeton	\$2,16
3960	7-p	Phaeton	2,16
4135	5-p	Brougham 4 d.	2,39
4415	7-p	Sedan DeLuxe	2,84
4460	7-p	Sub. Limousine	2,96

PIERCE-ARROW	"33"		
4350	2-p	Runabout	\$5,250
4590	5-p	Touring	5,250
4780	8-p	Coupe	6,800
4830	4-p	Sedan	6,900
4960	7-p	Sedan	7,000
4750	4-p	Coupe Sedan	6,900
4730	6-p	Brougham	6,800
4850	7-p	Limousine	7,000
5060	7-p	Enclosed Lim.	7,000
4780	7-p	French Lim.	7,000
4732	6-p	Landaulet	7,000
-----	2-p	Roadster	2,895
-----	4-p	Sp. Touring	3,095

3350	7-p	Touring	2,48
3525	5-p	Coupe	2,48
3550	5-p	Sedan	2,56
3725	7-p	Sedan	2,76
3825	7-p	Limousine	2,92

REO	"T-6"		
3300	2-p	Sp. Roadster	1,765
3182	5-p	Sport Touring	1,595
3450	4-p	Coupe	1,975
3400	5-p	Sedan 4 d.	1,595
3545	5-p	Sedan	2,085
3705	5-p	Brougham 4 d.	2,235

REVERE	"25"		
3900	2-p	Roadster	\$2,750
3975	4-p	Speedster	2,750
4050	5-p	Touring	2,750
4300	5-p	Sedan	3,800

"33"			
4350	2-p	Runabout	\$5.25
4590	5-p	Touring	5.25
4780	3-p	Coupe	6.86
4830	4-p	Sedan	6.90

RICKENBACKER	"C"		
2815	3-p	Sp. Roadster	\$1,595
2880	5-p	Sp. Touring	1,395

SHIP.
WT. PASS. BODY STYLE PRICE

3050	4-p	Coupe	1,895
-----	5-p	Coach Brough.	\$1,595
3160	5-p	Sedan	1,995
-----	-----	"A"	
3326	4-p	Sport Phaeton	2,195
3440	4-p	Coupe	2,695
3585	5-p	Sedan	2,795
-----	5-p	Coach Brough.	2,395

ROAMER	"6-54-E"		
-----	-----	(118 in. W. B.)	
3100	2-p	Roadster	\$2,685
3100	4-p	Tourer	2,485
3300	4-p	Sp. Touring	2,750
-----	7-p	Touring	2,685
-----	3-p	Cabriolet	3,285

-----	-----	(138 in. W. B.)	
4100	5-p	Spec. Sedan	4,250
4200	7-p	Suburban-Sedan	3,950
-----	-----	"4-75-E"	
3650	4-p	Sport	3,650
-----	-----	"4-85-E"	
3200	2-p	Spec. Speedster	3,785

ROLLIN			
2300	5-p	Touring	\$1,155
2315	3-p	Coupe	1,325
-----	5-p	Brougham	1,325
2485	5-p	Sedan	1,455

ROLLS-ROYCE			
-----	-----	Chassis	††
-----	-----	††Manufacturers do not quote list prices.	

STANLEY	"252"		
3770	5-p	Phaeton	\$2,500
4075	5-p	Sedan	3,300

STAR			
1700	2-p	Roadster	\$540
1790	5-p	Touring	540
1800	5-p	Touring F W B	745
1880	5-p	Spec. Touring	795
1980	2-p	Coupe	750
-----	5-p	Coach	750
2115	5-p	Sedan	820
2150	5-p	Spec. Sedan	1,090

STEARNS-KNIGHT			
-----	-----	"B" (4)	
-----	4-p	Coupe Roadster	\$1,795
3775	5-p	Touring	1,595
4250	5-p	Sedan	2,095
3750	4-p	Coupe Brougham	1,895
-----	5-p	Brougham	2,095

-----	-----	"B" (6)	
-----	2-p	Roadster	2,495
3775	5-p	Touring	2,395
3850	7-p	Touring	2,495
4025	2-p	Coupe	3,395
4275	4-p	Sp. Coupe	3,150
3950	5-p	Sedan	2,945
4275	7-p	Sp. Brougham	3,395

-----	5-p	Coupe	1,875
2115	5-p	Sedan	82
2150	5-p	Spec. Sedan	1,09

STEARNS-KNIGHT

STERLING-KNIGHT			
3200	4-p	Sp. Touring	\$2,250
3235	5-p	Phaeton	2,150
3300	7-p	Touring	2,400
3200	2-p	Coupe Roadster	3,100
3450	5-p	Sedan	2,800
3550	7-p	Sedan	3,050
3450	4-p	Sp. Brougham	2,750
3300	4-p	Coupe	3,200

STEVENS-DURYEA			
4200	2-p	Roadster	\$8,150
4400	7-p	Touring	7,500
4250	4-p	Sp. Touring	7,750
4600	4-p	Coupe	9,000
4600	4-p	Sedan	10,000
4800	6-p	Sedan	9,675
4800	6-p	Town Brougham	10,175
4800	6-p	Vestibule Limou.	9,675
4800	7-p	Vestibule Limou.	10,175
4800	7-p	% Limousine	10,175
4800	7-p	Cabriolet	10,175

STUDEBAKER			
-----	-----	Standard Six	
2510	2-p	Du. Roadster	\$1,125
2870	5-p	Du. Phaeton	1,145
-----	3-p	C. Club Coupe	1,345
3110	5-p	Coupe	1,445
3260	5-p	Sedan	1,545
3280	5-p	Berline	1,650

3525	4-p	Touring	1,875
3540	5-p	Touring	1,875
3550	2-p	Sport Coupe	2,185
3550	5-p	Coupe Brookham	2,300

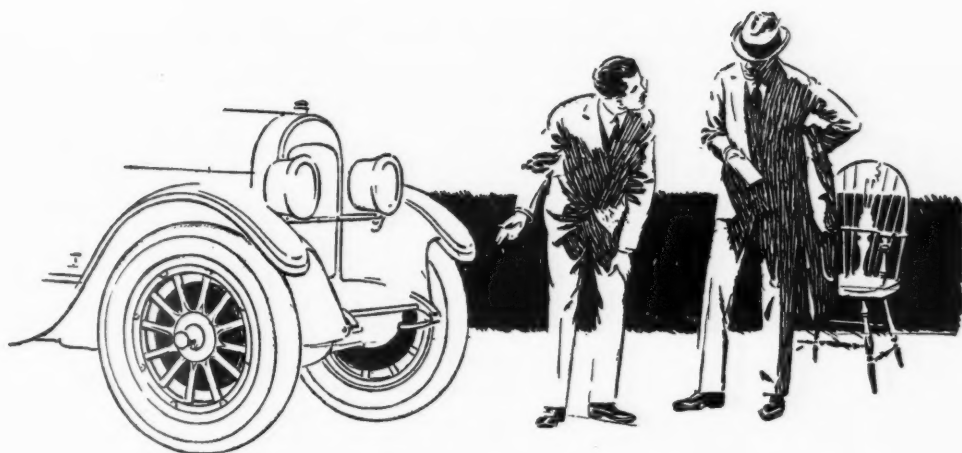
SHIP.
WT. PASS. BODY STYLE PRICE

3785	7-p	Big Six Du. Phaeton	\$1,875
4030	5-p	Coupe	2,450
4150	7-p	Sedan	2,575
4200	7-p	Berline	2,650
STUTZ		"693-4"	
3250	2-p	Roadster	\$2,880

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

MAKE AND MODEL		TIRES			ENGINE										Electrical System		Clutch	Gear-set	Universal Joints	REAR AXLE		BRAKES			Steering Gear	Rear Spring
		Wheelbase (Ins.)	Standard Size (Ins.)	Balloon Equipment	Make	Model	Number of Cylinders, Bore and Stroke (Ins.)	Rated Horsepower, N.A.A.C.C.	Valve Arrangement	Piston Material	Number of Main Crankshaft Bearings	Oiling System	Carburetor Make	Ignition System Make	Generator and Starter Make	Type and Make	Make	Type and Make	Type and Make	Gear Ratio	Foot, Type and Location	Hand, Type and Location	Four-Wheel Brake, Type	Make	Type and Length	
American.....D-65	127	33x4 1/2	No	H-Sp	91	6-3 1/2 x 5	29.40	L	C	3	PS	Str	A-K	G-D	P-B&B	War	M-Har	F-Sal	5.10	E-R	I-R	None	Lav	S-57 1/2		
Anderson.....41	115	31x5.2	Yes	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Zen	Wes	Rem	P-B&B	Dur	R-Thi	3/4 Sal	4.75	E-R	E-T	Mec*	Gem	S-58		
Anderson.....59	122	33x4.9	Yes	Cont	8R	6-3 3/4 x 4 1/2	27.34	L	C	4	PC	Zen	Rem	Rem	P-B&B	Dur	R-Uni	3/4 Sal	4.50	E-R	E-T	Mec*	Gem	S-58		
Apperson.....6	120	32x5.7	Yes	Own	6	6-3 1/2 x 4 1/2	24.40	I	C	4	FP	Str	Rem	Rem	P-Roc	Mec	M-Stl	3/4 Col	5.10	E-R	I-R	Mec*	Lav	J-18		
Apperson.....V-3	130	33x6.7	Yes	Own	8	8-3 1/2 x 5	33.80	L	C	3	PC	Sch	Rem	Rem	D-Own	Own	M-Thi	3/4 Own	5.10	E-R	I-R	Mec*	Own	J-48		
Apperson St-Away "8"	130	32x5.7	Yes	Own	St. "8"	8-3 1/2 x 4 1/2	31.25	L	C	3	PC	Sch	Rem	Rem	D-Own	Own	M-Sts	3/4 Own	4.63	E-R	I-R	Mec*	Ros	S-		
Auburn....."4"	108	29x4.4	Yes	Lyc	.....	4-3 3/4 x 5	21.03	L	C	5	PC	Str	Rem	Rem	P-B&B	W-G	M-Uni	1/2 Col	4.63	E-R	E-T	Mec*	Jac	S-57	
Auburn.....6-43	111	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Sch	Rem	Rem	P-B&B	W-G	M-Uni	1/2 Col	4.63	E-R	E-T	Mec*	Jac	S-57		
Auburn.....8-63	124	32x6.2	Yes	Lyc	H	8-3 1/2 x 4 1/2	31.25	L	C	5	PC	Sch	Rem	Rem	P-B&B	W-G	M-Uni	1/2 Col	4.63	E-R	E-T	Mec*	Jac	S-57		
Barley.....6-59	118	32x4	No	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	Del	Del	P-B&B	Ful	R-M&E	1/2 Col	5.11	E-R	I-R	None	Jac	S-56		
Buick....."Standard"	114 1/2	31x4.9	Yes	Own	Sta	6-3 x 4 1/2	21.60	I	C	4	PC	Mar	Del	Del	D-Own	Own	M-Own	3/4 Own	4.90	E-F	I-R	None	Jac	S-48		
Buick....."Master"	120	32x5.7	Yes	Own	Mast	6-3 3/4 x 4 1/2	27.34	I	C	4	PC	Mar	Del	Del	D-Own	Own	M-Own	F-Own	4.73	E-F	I-R	Mec	Jac	V-47 1/2		
Cadillac.....V-63	132	33x5	Yes*	Own	63	8-3 1/2 x 5 1/2	31.25	L	C	3	PC	Own	Del	Del	D-Own	Own	M-Spi	F-Own	4.50	B-F	I-R	Mec	Own	N-54		
Case.....X	122	32x4 1/2	Yes*	Cont	8R	6-3 3/4 x 4 1/2	27.34	L	C	4	PC	Ray	Del	Del	D-Own	Own	R-Sne	1/2 Col	4.90	E-R	I-R	Hyd	Jac	S-51 1/2		
Case.....JIC	122	32x4 1/2	Yes*	Cont	8R	6-3 3/4 x 4 1/2	27.34	L	C	4	PC	Sch	Del	Del	D-Own	Own	R-Sne	1/2 Col	4.90	E-R	I-R	Hyd	Jac	S-55		
Case.....Y	132	33x5	Yes*	Cont	6T	6-3 3/4 x 5 1/2	33.75	L	C	4	PC	Sch	Del	Del	D-Own	Own	R-Sne	3/4 Col	4.45	E-R	E-T	Hyd	Jac	S-57		
Chandler.....SS	123	33x6.0	Yes	Own	6	6-3 1/2 x 5	29.40	L	C	4	PC	Sch	Bos	Bos	P-B&B	Own	R-Own	3/4 Own	4.45	E-F	E-T	Mec	Own	S-58 1/2		
Chevrolet.....Superior	103	30x3 1/2	Yes*	Own	Sup	1-3 1/2 x 4	21.76	I	C	3	PS	Zen	Rem	Rem	P-Own	Own	M-Own	3/2 Own	3.82	E-R	I-R	None	None	S-54		
Chrysler.....Six	112 3/4	30x5.7	Yes	Own	Six	6-3 x 4 3/4	21.60	L	A	7	FP	Bal	Rem	Rem	D-Own	Own	M-Own	1/2 Own	4.60	E-F	E-T	Hyd	Jax	S-53		
Cleveland....."31"	118 1/2	30x4.9	Yes	Own	"31"	6-2 7/8 x 4 1/4	19.84	L	C	3	PS	Joh	Bos	Bos	P-B&B	Own	R-Own	1/2 Own	4.70	E-R	E-T	Mec*	Own	S-49		
Cleveland.....43	115 1/2	31x5.2	Yes	Own	43	6-3 1/2 x 4 1/2	23.44	L	C	3	PC	Sch	Bos	Bos	P-B&B	Own	R-Sne	1/2 Own	4.90	E-R	E-T	Mec*	CAN	S-53		
Cole.....Master	127	31x7.3	Yes	Nort	311	8-3 1/2 x 1 1/2	39.20	L	A	3	PC	Sch	Del	Del	D-Nor	Own	M-Spi	F-Col	4.10	E-R	I-R	None	Gem	S-57		
Cunningham.....V6	132	33x5	Yes*	Own	V4	8-3 3/4 x 5	45.00	L	A	3	FP	Str	Del	Del	D-Own	Own	R-Sue	F-Tim	4.23	E-R	I-R	None	Gem	J-62		
Dagmar.....6-60	118	32x4 1/2	Yes*	Cont	8R	6-3 3/4 x 4 1/2	27.34	L	C	4	PC	Sch	Del	Del	D-B&B	War	M-Spi	1/2 Tim	5.10	E-R	E-T	None	Gem	S-52		
Dagmar.....6-70	138	33x5	Yes*	Cont	6J	6-3 3/4 x 5	33.75	L	C	4	PC	Sch	Del	Del	D-B-L	War	M-Spi	1/2 Tim	4.90	E-R	I-R	None	Gem	S-52		
Daniels.....21-38	138	33x5	Yes*	Own	21-38	8-3 1/2 x 5 1/2	39.20	L	C	3	PC	Zen	Del	Del	P-Own	Own	M-Spi	F-Tim	4.23	E-R	I-R	None	Ros	S-		
Davis.....90	115	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	5	PC	Str	Del	Del	P-B&B	W-G	M-Pet	1/2 Tim	5.10	E-F	I-R	Hyd	Ros	S-52		
Davis.....91	118	32x4 1/2	Yes*	Cont	8R	6-3 3/4 x 4 1/2	27.34	L	C	4	PC	Sch	Del	Del	P-B&B	W-G	M-Pet	1/2 Tim	5.10	E-F	I-R	Hyd	Ros	S-52		
Dodge Brothers.....	116	30x5 1/2	Yes	Own	4	4-3 7/8 x 3 1/2	24.03	L	A	3	PS	Ste	N.E	N.E	D-Own	Own	M-Own	1/2 Own	4.54	E-R	I-R	None	Own	S-55		
Dorris.....	132	32x6.2	Yes	Own	6-80	6-4 x 5	38.40	I	A	7	PC	Str	Bos	Bos	D-Own	War	R-Spi	1/2 Tim	3.77	E-R	I-R	None	Ros	S-40		
Duesenberg Straight "8"	134	33x5	Yes	Own	"A"	8-2 1/2 x 5 1/2	26.45	I	A	3	PC	Str	Bos	Bos	P-Own	Own	R-Clh	1/2 Own	4.90	I-F	E-T	Hyd	Ros	S-59		
Dupont.....D	124	32x6.2	Yes	Wis	Y	6-3 3/4 x 5	27.34	I	A	3	FP	Sch	Bos	Bos	D-Lon	Cpl	M-Uni	1/2 Eat	4.45	E-R	I-R	Hyd	Jac	S-59		
Durant.....A-22	109	31x4	Yes*	Cont	Spec	4-3 7/8 x 4 1/4	24.03	I	A	3	PC	Til	A-L	A-L	P-Own	War	M-Spi	3/4 Ad	4.33	E-R	I-R	Mec*	War	S-50 1/2		
Elcar.....4-41	112	31x4	Yes*	Lyc	CF	4-3 3/4 x 5	21.03	L	A	5	PC	Zen	A-L	A-L	P-B&B	W-G	M-Mec	1/2 Sal	4.70	E-R	E-T	Mec*	Ros	S-51		
Elcar.....6-51	112	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	A	4	PC	Zen	A-L	A-L	P-B&B	W-G	M-Mec	1/2 Sal	4.70	E-R	E-T	Mec*	Ros	S-51		
Elcar.....6-61	118	32x4	Yes*	Cont	8R	6-3 3/4 x 4 1/2	27.34	L	C	4	PC	Str	Del	Del	P-B&B	W-G	M-Har	3/4 Sal	4.70	E-R	E-T	Mec*	Ros	S-52		
Elcar.....8-59	127	32x6.2	Yes	Lyc	H	8-3 1/2 x 4 1/2	31.25	L	C	5	PS	Sch	Bos	Bos	P-B&B	W-G	M-Spi	3/4 Sal	4.71	E-F	E-T	Hyd	Own	S-58		
Essex.....6	110 1/2	31x5.2	Yes	Own	6	6-2 1/2 x 4 1/4	17.22	L	A	3	Sp	Ste	Bos	Bos	D-Own	Own	M-Spi	3/4 Own	5.60	E-R	I-R	None	Own	S-54 1/2		
Flint.....40	115	30x5.2	Yes	Cont	6-W	6-3 1/2 x 4 1/4	23.44	L	C	4	PC	Car	A-L	A-L	P-Own	War	M-Spi	3/4 Ad	4.77	E-F	E-T	Hyd	Ros	S-50		
Flint.....55	120	32x5.2	Yes	Cont	55	6-3 3/4 x 5	27.34	L	C	7	PC	Str	DeJ	DeJ	P-Own	War	M-Spi	3/4 Ad	4.77	E-R	I-R	None	War	S-50		
Ford.....T	100	30x3 1/2	No	Own	T	4-3 3/4 x 4	22.50	L	C	3	Sp	Str	Own	Own	D-Own	Own	M-Own	1/2 Own	3.63	E-T	I-R	None	War	0-43 1/2		
Franklin.....10 C	115	32x4.9	Yes	Own	10-C	6-3 1/4 x 4	25.35	I	A	7	PC	Str	A-K	A-K	P-M&E	Own	M-Spi	1/2 Own	4.73	E-T	E-R	None	Own	E-38		
Gardner.....Series 5	112	32x4	Yes*	Lyc	CE	4-3 1/2 x 5	21.76	L	A	5	PC	Zen	Wes	Wes	P-B&B	Mec	M-Pet	3/4 Fli	4.80	I-R	I-R	None	Ros	S-51		
Gardner....."8"	125	30x5.7	Yes	Lyc	2H	8-3 1/2 x 4 1/2	31.25	L	C	3	Sp	Sch	Wes	Wes	P-B&B	Mec	M-Pet	1/2 Col	4.60	I-F	E-T	Hyd	Gem	S-58		
Gray.....O	101	30x3 1/2	Yes*	Own	8	4-3 3/4 x 4	21.03	L	C	3	Sp	Sch	Wes	Wes	P-Own	Det	R-Sue	1/2 Tim	3.90	I-R	I-R	None	Own	Q-30		
H.C.S.....Series 6	123	32x5	Yes*	Own	6	6-3 1/2 x 5	29.40	I	C	3	FP	Str	Del	Del	D-B-L	B-L	M-Spi	3/4 Own	4.63	I-R	I-R	None	Gem	S-56		
Haynes.....60	121	33x5.7	Yes	Own	60	6-3 1/2 x 4 3/4	29.40	L	C	3	PS	Ray	Kin	Del	D-Own	Mec	M-Thi	1/2 Own	4.41	E-R	E-T	None	Jac	S-54 1/2		
Hertz.....D-1	114	31x4	Yes	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	3	Sp	Zen	Del	Del	D-Lon	Own	Opt	1/2 Tim	4.90	E-R	E-T	None	Ros	S-56		
Hudson.....Super 6	127 1/2	33x6.2	Yes	Own	6	6-3 1/2 x 5	29.40	L	A	4	Sp	Ste	Bos	Bos	D-Own	Own	M-Spi	3/4 Own	4.45	E-R	I-R	None	None	S-57 1/2		
Hupmobile.....Series R	115	31x5.2	Yes	Own	R	4-3 1/2 x 5 1/2	16.90	L	C	3	PC	Str	Wes	Wes	D-Lon	Own	M-Uni									



Lockheed Hydraulics A Sales-Clincher

When your prospect is wavering between two good cars—yours and a competitor's—that's when you're in desperate need of some major advantage to swing his decision in your favor.

That's when the salesman of the car equipped with Lockheed Hydraulic Four-Wheel Brakes can cut loose with some such clinching sales argument as this:

"For your own safety, for the safety of your family, you want the most efficient braking—and we give you that in Lockheed Hydraulics.

"There are other four-wheel brakes, of course, but, unfortunately, many simply multiply the faults inherent in two-wheel brakes—such, for instance, as inevitable loss of equalization. This is due to their complicated system—rods, toggles and linkages—literally scores of extra parts which clutter up an otherwise clean chassis.

"Now, in Lockheed Hydraulics we make available four-wheel brakes which, because of the hydraulic principle, never lose their perfect equalization.

"Always, the same pressure is transmitted to each of the four brake bands.

"Furthermore, Lockheed Hydraulics are unapproached in simplicity of design. Note the clean

hydraulic construction. Note how simple and how directly they function. It's perfectly plain, isn't it, that the usual brake troubles are overcome in this design?

"You needn't accept my judgment when I tell you that Lockheed Hydraulics are better beyond comparison.

"Accept the preference of the automobile industry itself.

"Up to this time 56 manufacturers have equipped their products with some sort of four-wheel brakes.

"Forty of them went directly to Lockheed Hydraulic Four-Wheel Brakes.

"They give you stopping ability and a freedom from adjustments and rattles that you find in no other brake in the world."

That's the kind of sales-clincher a man can use when he's selling Lockheed Hydraulic equipped cars. It's tough for competition—but great for the manufacturers and the dealers whose cars are Lockheed equipped.

HYDRAULIC BRAKE COMPANY
5835 Russell Street Detroit, Michigan

The Answer
LOCKHEED HYDRAULIC
Four Wheel Brakes

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

MAKE AND MODEL		TIRES			ENGINE										Electrical System	Clutch	Gear-set	Universal Joints	REAR AXLE		BRAKES				Steering Gear	Rear Springs
		Wheelbase (Ins.)	Standard Size (Ins.) ¹ / ₂	Ballon Equipment	Make	Model	Number of Cylinders, Bore and Stroke (Ins.)	Rated Horsepower, N.A.C.C.	Valve Arrangement	Piston Material	Number of Main Crankshaft Bearings	Oiling System	Carburetor Make	Ignition System Make					Generator and Starter Make	Type and Make	Make	Type and Make	Type and Make	Gear Ratio ²			Foot, Type and Location	Hand, Type and Location	Four-Wheel Brake, Type	Make	Type and Length
Paige.....21-24	131	33x6.7	Yes	Cont	10A	6-3 1/2 x 5	33.75	L	C	4	PC	Ray	A-K	Rem	D-Lon	W-G	M-Mec	1/2 Sal	4.90	E-R	E-T	Hyd*	Gem	S-61 1/4		
Peerless.....70	126	33x6.2	Yes	Own	70	6-3 1/2 x 5	29.40	L	C	7	PC	Joh	Del	Del	D-Own	Own	M-Spi	1/2 Tim	4.66	E-F	I-R	Hyd	Gem	S-54		
Peerless, Equipoised "8"	133	33x6.6	Yes	Own	66	8-3 1/4 x 5	33.80	L	C	3	PC	Str	Del	Del	D-Own	Own	M-Spi	1/2 Tim	4.90	E-R	I-R	Hyd	Gem	S-80		
Pierce-Arrow.....33	138	33x5	No	Own	33	6-4 x 5 1/2	38.10	T	C	7	FP	Own	Del	Del	D-Own	Own	M-Spi	1/2 Own	4.29	E-R	I-R	Mec*	Gem	S-60		
Pierce-Arrow....."80"	130	32x5.7	Yes	Own	"80"	6-3 1/2 x 5	29.40	L	C	7	PC	Own	Del	Del	P-B&B	B-L	M-Spi	1/2 Tim	4.45	I-F	I-R	Mec	Gem	S-56 1/2		
Reo.....T6	120	32x6.2	Yes	Own	T6	6-3 1/2 x 5	24.34	G	A	4	PS	Sch	NE	NE	D-Own	Own	(M-Own)	1/2 Own	4.70	E-R	I-R	None	Own	S-54 1/2		
Revere.....25	131	32x6.2	Yes	Cont	6-J	6-3 1/2 x 5	33.75	H	C	4	PC	Sch	Bos	Wes	D-Ful	Ful	M-Spi	3/4 Col	3.75	I-F	E-T	Mec	Gem	S-56 1/2		
Revere....."M"	131	32x6	Yes*	Dues	G1	4-4 1/2 x 6	28.90	H	A	2	PC	Str	Bos	Wes	B-B-L	B-L	M-Spi	3/4 Spec	3.44	I-R	E-R	Mec	Gem	S-56 1/2		
Rickenbacker.....D	117	31x5.2	Yes*	Own	D	6-3 1/2 x 4 3/4	25.35	L	C	7	PC	Str	Bos	Bos	D-Own	W-G	M-Mec	1/2 Own	4.63	I-F	E-T	Mec	Gem	S-57		
Rickenbacker.....A	121 1/2	32x5.7	Yes	Own	A	8-3 x 4 3/4	28.60	L	C	9	PC	Zen	Del	Bos	D-Own	W-G	M-Mec	1/2 Own	5.10	I-F	E-T	Mec	Gem	S-59		
Roamer.....6-54-E	113	32x4 1/2	No	Cont	12XD	6-3 1/2 x 5 1/4	29.40	L	A	3	PS	Str	Spl	Wes	P-B&B	Ful	R-M&E	3/4 Tim	4.60	E-R	I-R	Mec*	Jac	V-55 1/4		
Roamer.....4-75-E	123	32x4 1/2	No	Dues	G1	4-4 1/2 x 6	28.90	H	A	3	FP	Str	Bos	Wes	D-B-L	B-L	R-M&E	3/4 Tim	4.63	E-R	I-R	Mec*	Jac	V-55 1/4		
Rollin.....G	112	31x5.2	Yes	Own	G	4-3 1/2 x 4 1/2	16.90	L	A	4	PC	Til	Con	Dyn	P-B&B	Mun	R-Own	1/2 Sal	5.10	I-F	I-F	None	Ros	O-46		
Rolls-Royce.....40-50	143 1/2	33x5	No	Own	40	6-4 1/2 x 4 3/4	48.60	L	A	7	FP	Own	Con	Wes	K-Own	Own	M-Own	1/2 Own	3.72	I-R	I-R	None	Own	S-54 1/2		
Stanley.....252	122	31x4.9	Yes	Own	252	2-4 x 5	13.00	X	C	2	Sp	Non	Non	Bos	Non	P-Own	Non	R-The	1/2 Own	4.50	E-F	I-R	Hyd	Ros	S-58	
Star.....4	102	30x3 1/2	Yes*	Cont	Spec	4-3 1/2 x 4 1/2	18.23	I	A	3	PK	Til	A-L	A-L	P-Own	War	M-Spi	3/4 Ad	4.87	E-R	I-R	Mec*	War	S-49 1/2		
Stearns Knight.....C	121	32x6.2	Yes	Own	K-i	6-3 1/2 x 5	25.35	X	C	4	PC	Joh	DeJ	DeJ	D-M&E	Own	R-Chi	1/2 Own	5.30	E-R	I-R	Hyd*	Ros	V-50		
Stearns Knight.....B	119	33x4 1/2	Yes*	Own	Kni	4-3 1/2 x 5 1/2	22.50	X	C	3	PC	Joh	A-K	A-L	D-Own	Own	R-Chi	1/2 Own	4.50	E-R	I-R	Hyd*	Ros	V-50		
Stearns Knight.....S	130	33x6.0	Yes	Own	Kni	6-3 1/2 x 5	29.40	X	C	4	PC	Joh	DeJ	DeJ	D-M&E	Own	R-Chi	1/2 Own	4.90	E-R	I-R	Hyd	Ros	V-50		
Sterling Knight.....125	125	32x4 1/2	Yes*	Own	Kni	6-3 1/2 x 4 3/4	25.35	X	C	7	FP	Str	Wes	Wes	D-Ful	Ful	R-Chi	1/2 Tim	5.09	E-R	I-R	H	Ros	S-58		
Stevens-Duryea.....G	133	33x5.5	Yes*	Own	G	6-4 1/2 x 5 1/2	47.25	L	C	4	PS	Str	Bos	Bos	D-B-L	B-L	M-Spi	1/2 Tim	3.76	E-R	I-R	None	Ros	S-57 1/2		
Studebaker.....Sta. Six	113	31x5.2	Yes	Own	ER	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Str	(Wag)	(Wag)	P-Own	Own	R-The	1/2 Own	4.18	E-R	E-T	Hyd*	Own	S-50 1/2		
Studebaker.....Spec. Six	120	32x6.2	Yes	Own	EQ	6-3 1/2 x 5	29.40	L	C	4	PC	Str	(Wag)	(Wag)	P-Own	Own	M-Spi	1/2 Own	4.36	E-R	E-T	Hyd*	Own	S-56		
Studebaker.....Big Six	127	31x7.3	Yes	Own	EP	6-3 1/2 x 5	36.01	L	C	4	PC	Bal	(Wag)	(Wag)	P-Own	Own	M-Spi	1/2 Own	3.69	E-R	E-T	Hyd*	Own	S-56		
Stutz.....693-4	120	32x4 1/2	Yes*	Own	691	6-3 1/2 x 5	29.40	I	C	3	PC	Str	Rem	Rem	P-B&B	W-G	M-Mec	1/2 Tim	5.10	E-R	I-R	None	Gem	S-61 1/4		
Stutz.....695	130	32x4 1/2	Yes*	Own	691	6-3 1/2 x 5	29.40	I	C	3	PC	Str	Rem	Rem	P-B&B	W-G	M-Mec	1/2 Tim	4.90	E-R	I-R	Hyd*	Gem	S-61 1/4		
Templar.....122	122	33x4	No	Own	50	6-3 1/2 x 5	27.31	L	C	4	PS	Til	Dyn	Wes	P-M&E	W-G	R-Sne	3/4 Sal	5.10	I-F	E-T	Mec	Ros	S-54		
Vellie.....60	118	31x5.2	Yes	Own	12X	6-3 1/2 x 5 1/2	29.40	L	A	3	PS	Ray	Del	Del	P-B&B	B-L	M-Pet	1/2 Tim	4.45	E-R	E-T	Hyd	Ros	S-55		
Westcott.....48	125	32x4 1/2	Yes*	Cont	8R	6-3 1/2 x 5 1/2	27.34	L	C	4	PC	Str	Del	Del	P-B&B	W-G	M-Pet	1/2 Col	4.90	E-R	E-T	Hyd*	Gem	S-57 1/2		
Westcott.....44	120	32x6.2	Yes	Own	8R	6-3 1/2 x 5 1/2	27.34	L	C	4	PC	Str	Del	Del	P-M&E	W-G	M-Pet	1/2 Col	4.63	E-R	E-T	Hyd*	Gem	S-56		
Westcott.....60	118	32x6.2	Yes	Own	8R	8-3 1/4 x 4	33.80	I	C	3	FP	(Zen)	Del	Del	P-Own	Own	M-Spi	1/2 Eat	4.45	(E-R)	(I-R)	(None)	Own	S-54 1/2		
Wills Ste. Claire. A&B63	121	32x4 1/2	Yes*	Own	A68	8-3 1/4 x 4	33.80	I	C	3	FP	(Sch)	Del	Del	P-Own	Own	M-Spi	1/2 Eat	4.45	(E-F)	(I-R)	(None)	Hyd	S-58		
Wills Ste. Claire. "W-6"	127	32x6.2	Yes	Own	"6"	6-3 1/2 x 5 1/2	25.35	I	C	7	....	Sch	Del	Del	P-Own	....	....	1/2 Eat	4.45	E-F	E-T	Hyd	Own	....	
Willys Knight.....65 & 67	118	33x1.9	Yes	Own	65	4-3 1/2 x 4 1/2	21.03	X	C	3	PS	Til	A-L	A-L	D-Own	Own	R-Own	3/4 Own	(4.44)	E-R	I-R	None	Own	S-55		
Willys Knight....."6"	126	32x6.2	Yes	Own	"6"	6-3 1/2 x 4 3/4	25.35	X	....	7	PC	Til	A-L	A-L	D-Own	Own	M-Mec	1/2 Own	5.11	B-F	E-R	Mec	Own	S-57 1/4	

TAXICABS

Checker.....	117	33x4½	No	Buda	WTU	4-3½x5½	22.50	L	C	3	PC	Zen	Sci	Wes	D-Ful	Ful	Blo	¾ Col	4.87	E-R	I-R	None	Jon	S-57½	
Driggs.....	108½	30x3½	No	Own	.....	4-2½x4½	11.03	L	C	.....	PS	Zen	Bos	Bos	D-Ful	Ful	Spi	¾ Own	4.74	E-R	I-R	None	Own	S-
Elcar.....4	112	31x4	Yes*	Lycor	CF	4-3½x5	21.03	L	A	5	PC	Zen	A-L	A-L	P-B&B	W-G	M-Mec	½ Sal	4.75	E-R	E-T	Mec*	Ros	S-51	
Elcar.....6	118	32x4	Yes*	Cont	8R	6-3½x4½	27.34	L	C	4	PC	Str	Del	Del	P-B&B	W-G	Spi	¾ Sal	4.75	E-R	I-R	Mec*	Ros	S-52	
H.C.S.....	110	29x4½	No	Wauk	CH	4-x3½	5	19.60	L	A	5	FP	Zen	Bos	Bos	P-B&B	W-M	M-Spi	¾ Own	5.10	I-R	E-R	E-T	Ros	S-
Kelsey.....E	112	32x4	No	Lycor	WTU	4-3½x5½	22.50	L	A	5	PC	Zen	Bos	Bos	P-B&B	W-M	M-Spi	¾ Own	5.10	E-R	I-R	None	Lav	S-55	
Luxor....."Lux"	118	33x4½	No	Buda	WTU	4-3½x5½	22.50	L	A	5	PC	Zen	Bos	Bos	D-Ful	Ful	M-Spi	½ Col	.....	E-R	E-T	None	Gem	S-56½
Pennant.....	115	33x4½	No	Buda	WTU	4-3½x5½	22.50	L	B	3	PC	Zen	Bos	Bos	D-Ful	Ful	Blo	¾ Col	4.87	E-R	I-R	None	Jon	S-57	
Premier.....4A	118	33x4½	No	Buda	WTU	4-3½x5½	22.50	L	B	3	PC	Zen	Bos	Bos	D-Ful	Ful	Blo	¾ Col	4.70	E-R	I-R	None	Ros	S-57½	
Rauch & Lang.....T	112	32x4	No	Buda	WTU	4-3½x5½	22.50	L	C	3	Sp	Zen	Bos	Dyn†	D-Dtl	Det	Spi	½ Sta	5.10	E-R	E-T	None	Gem	S-50½	
Rauch & Lang**	102	33x4½	No	Own	Electric	.....	.....	.....	.....	.....	.....	.....	.....	.....	None	None	Own	Own	8.60	.....	.....	None	None	S-
Reo.....	113	32x4½	Yes*	Own	T-6	6-3½x5	24.30	G	A	4	PS	Sch	N-E	N-E	D-Own	Own	Own	½ Own	4.70	E-R	I-R	None	Own	S-54	
Traveler.....	108½	32x4	No	Buda	WTU	4-3½x5½	22.50	L	B	3	PC	Zen	Eis	Eis	D-Dtl	W-M	Spi	Col	E-R	I-R	None	Gem	S-
White.....15A	119	31x4½	No	Own	GK	4-3½x5½	22.50	L	C	.....	Sp	Zen	Opt	Opt	P-Own	Own	.....	¾ Own	5.36	E-R	I-R	None	Own	S-55
Willys Knight.....A.B.C.	118	32x4½	Yes*	Own	64	4-3½x4½	21.03	X	C	3	PS	Til	A-L	A-L	D-Own	Own	Own	¾ Own	5.12	E-R	I-R	None	Own	S-55	
Yellow.....	109	32x4½	No	Cont	V7	4-3½x5	22.50	L	C	3	Sp	Zen	Bos	N-E*	D-B-L	B-L	Spi	¾ Tim	4.90	E-R	E-T	None	Gem	S-56	
Yellow.....A-2	109	29x1½	Yes	Cont	V7	4-3½x5	22.50	L	C	3	Sp	Zen	Bos	N-E†	D-B-L	B-L	Spi	¾ Tim	4.90	E-R	E-T	None	Gem	S-56	

ABBREVIATIONS—

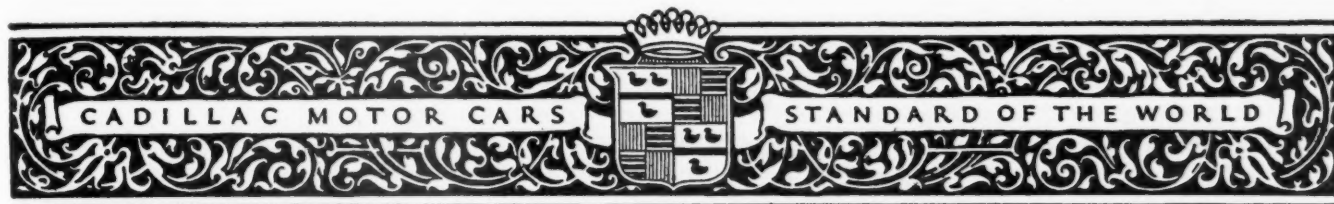
*—Electric
 †Generator only
 *—At extra cost
 ‡—On Phaeton models
 A—Aluminum
 Anst—Ansted
 Ad—Adams
 A-K—Atwater-Kent
 A-L—Auto-Lite
 B—Semi Steel
 Bal—Ball & Ball
 B & B—Borg & Beck
 B-F—Both Internal and External Four Wheels
 Bij—Bijur
 B-L—Brown-Lipe
 Blo—Blood
 Ros—Bosch
 C—Cast Iron
 Car—Carter
 Cl—Climax
 Col—Columbia
 Con—Connecticut
 Cont—Continental
 Cpl—Campbell
 D—Multiple Disc

Del—Delco
 Det—Detroit
 De J—De Jon
 Dit—Ditwiler
 Doo—Dooley
 Dtl—Detlaft
 Dues—Duesenberg
 Dur—Durstion
 Dyn—Dyneto
 E—Full Elliptic
 E-F—External Four Wheels
 E-R—External Rear Wheels
 E-T—External Transuission
 Eat—Eaton
 F—Full Floating
 Fall—Falls
 Fil—Flint
 FP—Full Pressure to all bearings including wrist pins
 Ful—Fuller
 1/2 F—Semi Floating
 3/4 F—Three-Quarter Floating
 G—Head and Side
 G-D—Gray & Davis
 Gem—Gemmer
 G-L—Grant-Lees
 Goo—Goodrich

H—Horizontal
 Har—Hart
 Hol—Holley
 Hoo—Hoosier
 H-Sp—Herschell-Spillman
 Hyd—Hydraulic
 I—In Head
 I-F—Internal Four Wheels
 I-R—Internal Rear Wheels
 J—Three-Quarter Elliptic
 Jac—Jacox
 Jax—Jaxon
 Joh—Johnson
 Jon—Jones
 K—Cone
 Kin—Kingston
 L—L Head
 Lav—Lavine
 Lon—Long
 L-N—Leece-Neville
 Lycor—Lycorning
 Mar—Marvel
 M—Metal
 M & E—Merchant & Evans
 Mec—Mechanics
 Mons—Monson
 Mun—Muncie

N—Platform
 Non—None
 N. E.—North East
 Nor—Northway
 O—Special Type
 Opt—Optional
 P—Single Plate
 PC—Pressure to all Crankshaft and connecting rod bearings
 Pen—Penfield
 Pet—Peters
 Pic—Pick
 PK—Pressure to Crankshaft, Connecting Rods, and Camshaft Bearings
 PS—Splash and Pressure
 Q—Quarter Elliptic
 R—Fable
 Ray—Rayfield
 Rem—Remy
 Roc—Rockford
 Ros—Ross
 S—Semi Elliptic
 Sal—Sallsbury
 Sch—Schebler
 Sci—Scintilla
 Sco—Scoe

Sne—Snead
 Sp—Circulating Splash
 Spe—Special
 Spl—Spicer
 Spl—Splittorf
 S. E.—Standard Equipment
 Sta—Standard
 Ste—Stewart
 Stil—Sterling
 Str—Stromberg
 T—T Head
 The—Thermoid
 Thi—Thiener
 Til—Tillotson
 Tim—Timken
 Uni—Universal
 Uds—Universal Drive Shaft
 V—Cantilever
 W-G—Warner Gear
 W-M—Willys-Morrow
 Wag—Wagner
 War—Warner
 Wed—Weldley
 Wes—Westinghouse
 Wis—Wisconsin
 X—Sleeve
 Zen—Zenith



The Human Desire to own the best Suggests . . . the CADILLAC

Cadillac Dealers have the most vital of all sales advantages: a *receptive market*. In the course of each succeeding sales interview they find further evidence that the human desire to own the best suggests the Cadillac.



CADILLAC



Rear Springs

Type and Length

S-61 1/2
S-64
S-60
S-50 1/2
S-54 1/2
S-58
S-49 1/2
V-50
V-50
S-58
S-57 1/2
S-50 1/2
S-50
S-50
S-61 1/2
S-61 1/2
S-64
S-65
S-59
S-57 1/2
S-56
S-54 1/2
S-58
S-55
S-57 1/2

S-57 1/2

S-51

S-52

S-55

S-56 1/2

S-57

S-57 1/2

S-50 1/2

S-54

S-55

S-56

S-58

Drive Shaft

Gear

orror

ome

Splash

Equipment



CADDO CENTRAL OIL & REFINING CORPORATION
 NEW YORK OFFICE 81 BROADWAY
 SHREVEPORT, LA.
 GENERAL OFFICE SHREVEPORT, LA.
 Nov. 10- 1924
 SUBJECT

American Oil Pump & Tank Company,
 Cincinnati, Ohio.

Gentlemen:-

We have been using your equipment for the past year and we are well pleased with results obtained. We have installed several of your New Rotary pumps in our territory and their service has been satisfactory in every way.

We are also well pleased with your visible lubricating tanks both in two and three compartments, and we have standardized on this equipment.

Your representative in this territory has given us the very best of service when we have had any trouble. However, the trouble we have had has been very small indeed.

With best wishes, we are,

Yours truly,

Caddo Central Oil & Refg. Corpn.

By *A. S. Gillman*
 Manager Retail Department

ADT/h

**Adjustable
 Overflow
 insures exact
 measure
 at each
 gallon mark**

The above letter expresses the unbounded satisfaction which users everywhere are getting from the new American Pump V-140.

This new American has specially constructed ROTARY PUMP—handle moves *continuously* in forward direction—not back and forth. Much faster and easier than with the jerky back and forth motion.

With this pump you can fill 5 gallon container in 10 to 12 seconds with 15 turns of handle. Compare this *high speed operation* with other rotary pumps—which require not less than 12 forward and 12 back strokes—24 in all and time lost in starting and stopping.

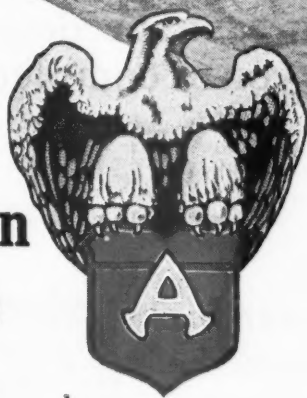
Extreme simplicity is a feature of V-140 which means few parts, low cost, long service, low upkeep. Furnished with either 5 or 10 gallon container and with Underwriters' Label if desired.

Cut the time and cost of selling gasoline by installing this new American Visible Pump—V-140.

American *Visible*



American Visible Lubes



Lead the World

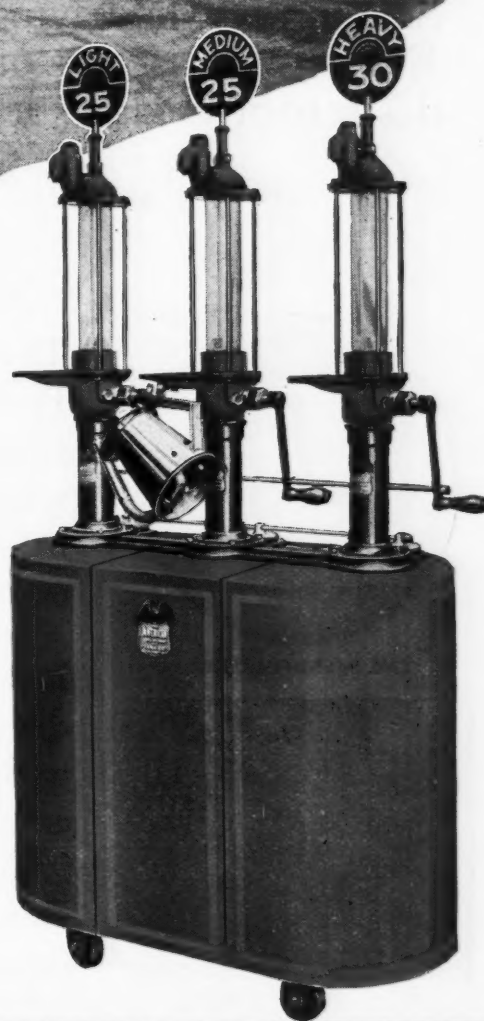
They are modern, time-saving, clean, accurate and absolutely non-dripping. They take the uncertainty out of the purchase of oils and inspire confidence. The motorist can see just what he is getting.

The AMERICAN is the ONLY Lube with absolutely non-drip nozzle—not a drop in 24 hours. The only Lube without a return line draining into tank carrying dust and dirt.

The AMERICAN Lube has long, thin 3-inch visible glass tube, giving *visibility* and *easy operation*. All working parts are in neck and operate in oil, protected from dust and dirt.

The above features are necessary to a perfect Lube—and the AMERICAN is the ONLY LUBE which offers you all these features. Install AMERICAN VISIBLE LUBES—sell more oil—increase your profits—build up your oil business.

The American Oil Pump & Tank Co.
1159 Findlay Street, Cincinnati, Ohio



Equipment *for Gas & Oil*

The Truth Teller

*Ford owners
want to know—*

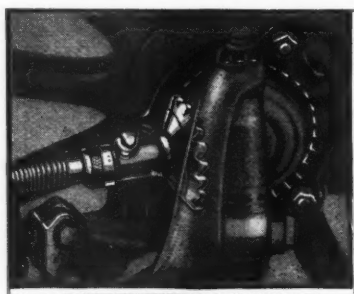
- | | |
|------------------------------------------------------------|------------------------------------------|
| 1 How fast they are going. | 4 When to change oil and grease the car. |
| 2 How far they go. | 5 Their mileage per gallon of gasoline. |
| 3 When to turn when touring
and following mileage maps. | 6 Their mileage from tires. |

Safe enjoyable driving demands that they know these things. Every motorist not only wants but needs a speedometer. The desire to buy exists—it is simply up to you to complete the sale.

AC SPEEDOMETER For FORDS



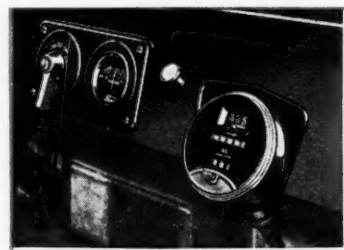
THE SPEEDOMETER



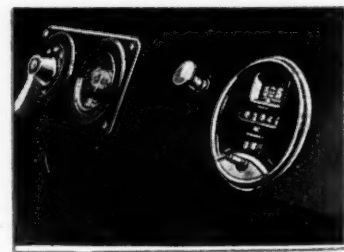
THE AC DIRECT DRIVE

The AC Speedometer for Fords tells Ford owners the things they want to know and what it tells them they can bank on—it's a truth-teller every minute and every mile.

It has a wonderfully simple direct drive which does away with the swivel joint, comes complete with all attachments, is easily and quickly installed, nationally advertised and carries a good margin of profit.



Two methods of installation are shown: Above in bracket furnished with instrument. Below through a round hole in the instrument board.



Because more than half of the automobiles manufactured are Fords, all being turned out without a speedometer, this affords you a big field for immediate and continued profit.

AC-SPHINX
Birmingham
ENGLAND

AC Spark Plug Company, FLINT, Michigan
Makers of AC Spark Plugs—AC Speedometers

U. S. Pat. No. 1,135,727, April 13, 1915; U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

AC-OLEO
Levallois-Perret
FRANCE

ATWATER KENT

Scientific Ignition



Price \$10⁸⁰

*Including cables
and fittings*

REAL utility and increased efficiency are two powerful arguments anyone can use in favor of an ignition system.

Combine with these the proven quality of ATWATER KENT Ignition, Type L. A., plus its popularity and low price, and you have the ideal unit for a steady and profitable replacement business for Ford cars.

Day by day, the demand among Ford owners for this system is increasing. Make up your mind today to get your share.

ATWATER KENT MANUFACTURING COMPANY
4733 Wissahickon Ave., Philadelphia, Pa.

MACH

MULTIBESTOS

MULTI
BRAKE

INES!

MULTIBESTOS announces a motor driven Brake Relining Machine that

1. Punches out the old rivets from lining and band—
2. Drills and countersinks the new lining at one operation—
3. Heads over the new rivets.

The price is within reach of every garage-man. Write for information regarding the 1925 Multibestos Service Station Franchise.

MULTIBESTOS COMPANY, Walpole, Mass., U. S. A.

Branches: NEW YORK CHICAGO DETROIT NASHVILLE

Multibestos Brake Lining

Multibestos TAXITRUX Brake Lining

Multibestos 229 Transmission Lining for Ford Cars

Multibestos SPECIAL Transmission Lining for Ford Cars

Multibestos NO-WIRE Transmission Lining for Ford Cars

Multibestos FIBRE Transmission Lining for Ford Trucks

Multibestos Lined Brake Shoes for Ford Cars

Multibestos Clutch Linings

BESTOS

LINING

For more than 20 years
dissolved acetylene for
welding and cutting
has been supplied in
portable cylinders by

Prest-O-Lite

DISSOLVED ACETYLENE

THE PREST-O-LITE COMPANY, INC.

Oxy-Acetylene Division

General Offices: Carbide & Carbon Bldg., 30 East 42d St., New York

In Canada: Prest-O-Lite Co. of Canada, Limited, Toronto

31 Plants—55 Warehouses—21 District Sales Offices



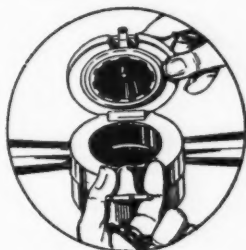
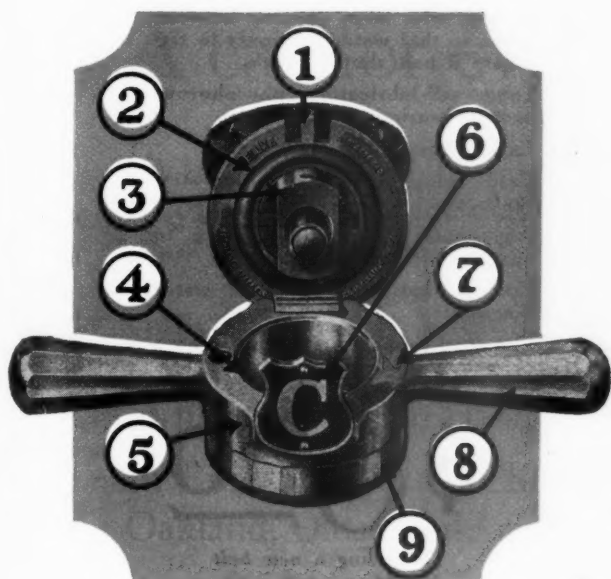
The lowest priced
fine cap on the
market.

\$3.50

for small cars

\$5.00

for larger cars



**Locks on—!
Snaps open—!
Clicks shut—!**

The beauty of the Bethlehem De Luxe Radiator Cap appeals to the motorist. The distinctive decagon bars, the graceful design, the handsome finish arouse admiration, and its practical usefulness produces desire. Then—when it's found to be the lowest priced fine cap on the market—it's a sale!

Study the other features shown to left. A size for every car. Write for information on Bethlehem sales helps and Bethlehem discounts.

Talk these features and boost your sales

1. Handy snap latch.
2. Leak proof! Solid rubber gasket seals cover when closed.
3. Ornament or Motometer lock.
4. Concealed set screw thru body of cap prevents theft.
5. Blind hinge pins of special non-rusting alloy.
6. Owner's initial or fraternal emblem in silver and black.
7. Numbered — easy to select proper cap for any car.
8. Decagon Bars — exclusive Bethlehem design.
9. A solid cap without sleeves — never jiggles out of place.

Bethlehem Spark Plug Co., Inc.
Bethlehem, Pa.

E. H. SCHWAB, President

BETHLEHEM
De Luxe Radiator **CAPS**

Easy to Sell

A pump for Fords that quickly pays for itself

U-NEED-IT Pump for Fords is built to live the life of the car on which it is installed—and to save time, money and trouble for the owner EVERY DAY.

IN THE WINTER TIME it saves alcohol, oil, radiators, time, etc., and insures a better operating car which produces more for the money spent.

IN THE SUMMER it keeps the engine at an equable temperature saving oil, gasoline, water trouble in filling and prevents the danger of operating on too little water.

Just because the plucky little Ford will operate under adverse conditions of heat and cold does not mean that extremes are not hard on it.

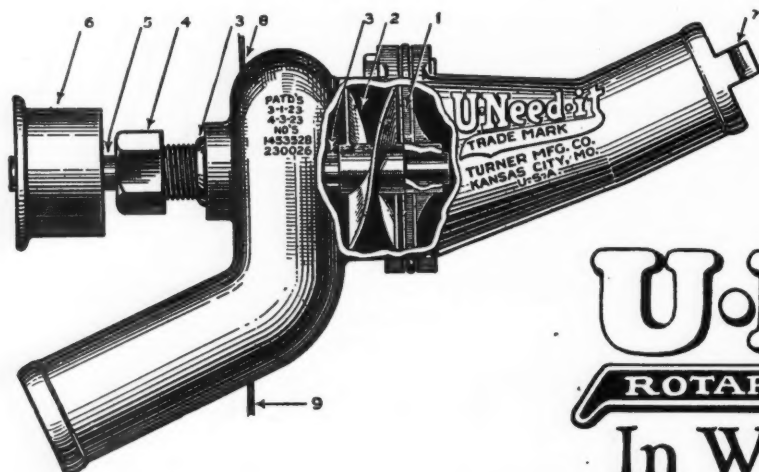
It is a valuable thing to be able to maintain an even temperature at all seasons, such as the U-NEED-IT Pump will do.

So, we ask you as a dealer to investigate U-NEED-IT Pump—to learn why the Ford owner prefers it—to get our printed matter—or order a carton of 6 from your jobber and start the ball rolling toward less resistance in sales.

An all year seller!

THE TURNER MFG. CO.

31st and Roanoke Road
Kansas City, Mo.



BILL

Oil ?
Gas ?
Alcohol ?
Upkeep ?
Lay Up ?

POSITIVE ADVANTAGES

1. Self-centering, self-lubricating, phosphorous bronze bearing.
2. Rotary, with large opening between blade so that water continues to circulate if belt should break.
3. Long self-lubricating phosphorous bronze bearing.
4. Extra large brass packing nut.
5. Cold rolled special 1/2-inch steel shaft.
6. Adjustable pulley for aligning to any model Ford Car.
7. Bracket that rests inside of water manifold.
- 8-9. Flat steel support bolted to top hose connection and rests on crank case.

\$6.50

Including a new belt
\$7 West of Rockies

U-Need-It

ROTARY PUMP FOR FORDS

In Winter and Summer

FACTS ABOUT A FAMOUS FAMILY



A car for every purse and purpose

In the automobile industry several distinct price classes have developed.

General Motors, a family of car and truck builders, offers a choice of models in each class.

In Buick, Cadillac, Chevrolet, Oakland, Oldsmobile and GMC

Trucks, there is a car for every purse and purpose—purchasable on a sound payment plan.

Back of each car are all the resources of General Motors—an assurance of scientific excellence, continuing service and satisfactory value.

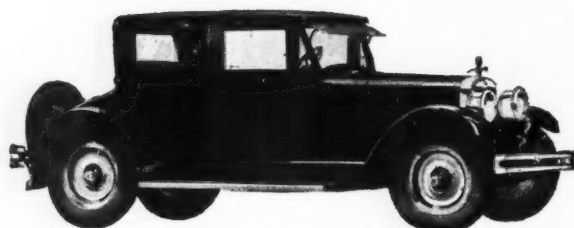
GENERAL MOTORS

BUICK • CADILLAC • CHEVROLET • OAKLAND
OLDSMOBILE • GMC TRUCKS

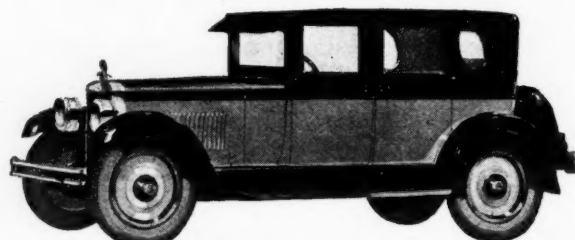
General Motors cars, trucks and Delco-Light products may be purchased on the GMAC Payment Plan.
Insurance service is furnished by General Exchange Corporation

Rickenbacker

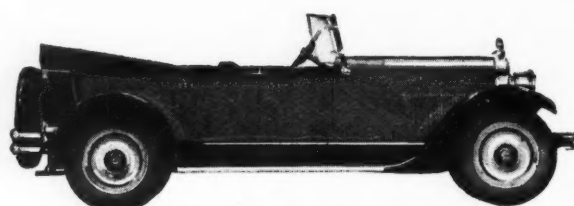
A • CAR • WORTHY • OF • ITS • NAME



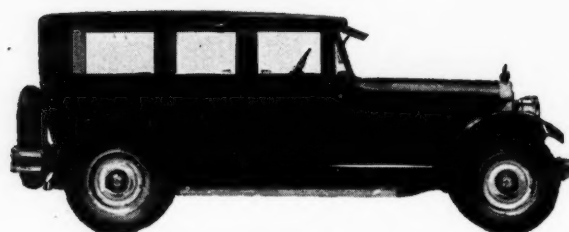
4 Passenger Coupe, \$2695



5 Passenger Brougham, \$2395



5 Passenger Phaeton, \$2195



5 Passenger Sedan, \$2795

All prices are f.o.b. Detroit plus war tax

Tremendous Possibilities in this "Vertical-8-Superfine" with "America's Six Supreme"

Until you have actually driven this car with your own hands on the wheel you cannot appreciate the superlative performance of which it is capable. **Q** It is an entirely new and novel sensation in motoring. **Q** In this line as in the "Six" there is a "Leader" also, for which there is no rival. **Q** This is the new 4-door Brougham — a 5-passenger car — at \$2,395. **Q** Just consider — here is a beautifully designed, splendidly built, closed body on that famous "Vertical-8-Superfine" Chassis at the price you have been asking for an ordinary open car.

Rickenbacker Motor Company

Detroit, Michigan



What every open car owner wants

Closed car comfort and protection with the open car's airy freedom

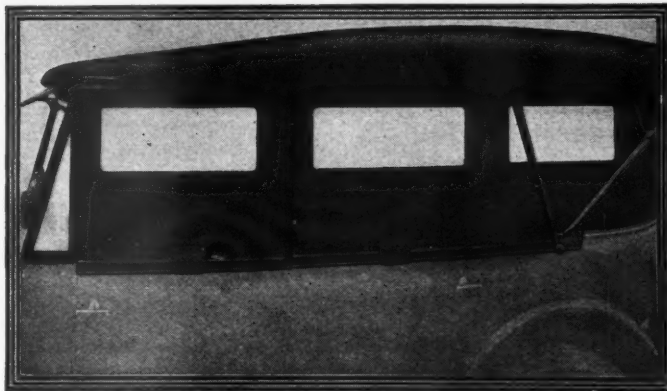
ROLLS UP AND DOWN, JUST LIKE THE STUDEBAKER DUPLEX

Wedford Evr-Ready Enclosure AUTOMATIC

Licensed Under Thurber Patents

Three enclosure sections to each side of the car assembled on one unit work up and down on rollers. Each has full 3-inch overlap. Entire enclosure instantly rolls into concealed storage. Each section stored separately, in perfect condition.

No interference with doors. No stays, up-rights, braces or guides. No sections to be fitted together. Unit structure from front to rear of top inside.



Can be opened or closed more quickly than a sedan.

Women can operate without soiling their gloves.

Cannot be put on wrong.

Has only one fastener to each section, and that will not rattle.

Quickly, easily installed!

75% of the Car Owners in Your Territory are Prospects

Now you can sell what every open car owner wants: closed car *comfort* and *protection* that doesn't mean a sacrifice of the *glorious airy freedom* of the open car.

A *weather-tight* enclosure that rolls up and down, just like the Studebaker Duplex. A quick shift from open car freedom to closed car protection in 30 seconds, and the driver doesn't even leave his seat.

Doesn't that sound like something that will sell? . . . You know it will! And it is selling wherever dealers have displayed it! 75% of the car owners in your territory are prospects. More than 75% of the cars are *open* cars—and the Wedford Evr-Ready Automatic Enclosure fits practically all of them, new models and old. It was the center of unusual interest at the Chicago Automobile Show.

Puts an end to the old, shabby, button-on, hard-to-get-on flapping curtains. A hundred times better looking. More convenient and neater than heavy, bunglesome glass enclosures. And above all it's an all-year-round sales proposition. As desirable in summer as in winter. Keeps out rain, wind and dust as well as sleet, snow and cold.

You'll appreciate the big selling advantages it gives where the open models of the car you're handling are in competition with lower priced closed cars. It's the only enclosure that can clinch an open car sale in competition, all other things being equal. Keeps old customers satisfied. *Helps to sell used cars.* . . . Get complete details at once. Made by

THE WEDLER-SHUFORD COMPANY, ST. LOUIS, MISSOURI

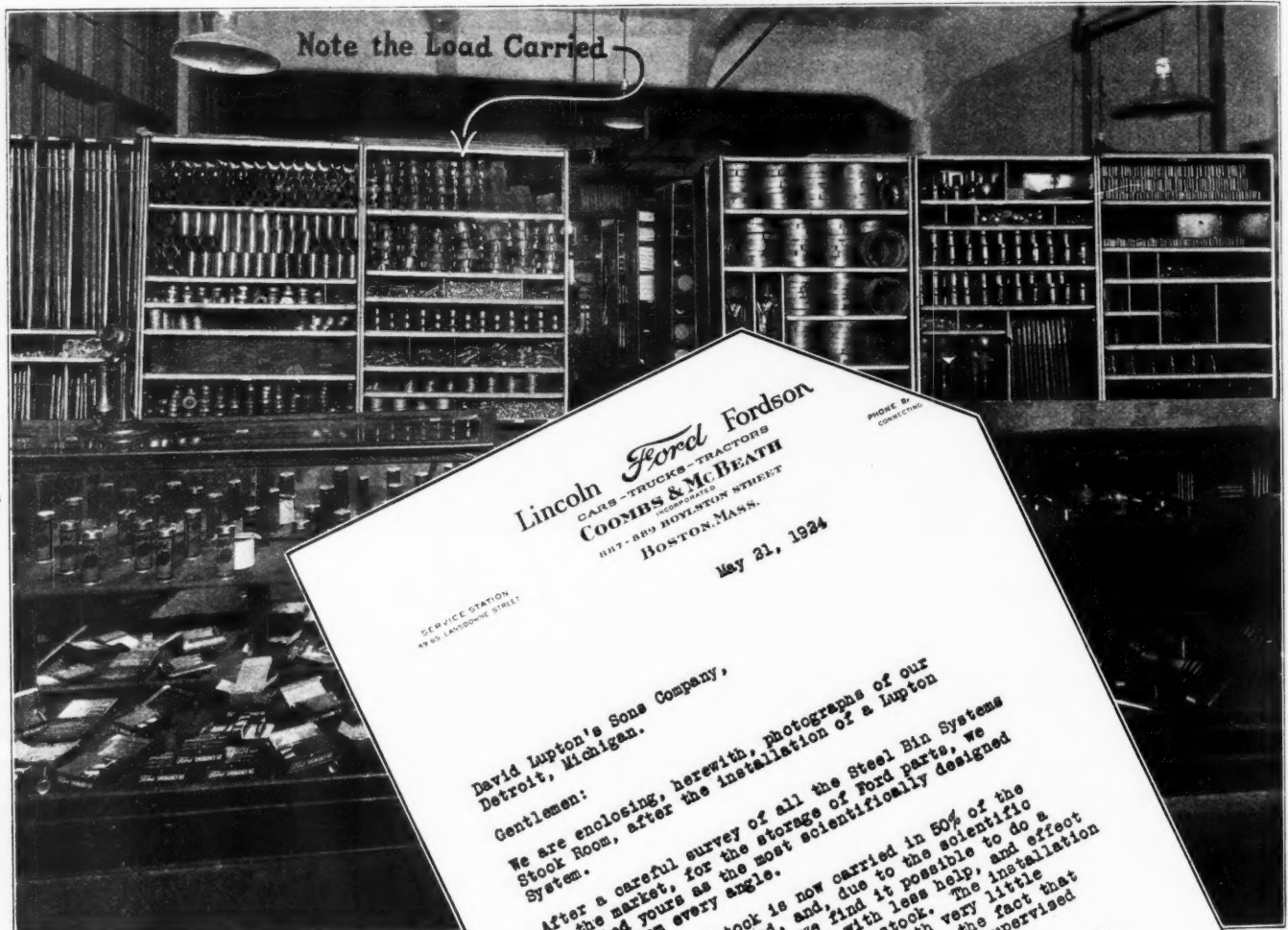
Licensed Under Thurber Patents

"A Wedford Product Always Sells"

Wedford

AUTOMOTIVE PRODUCTS

Arthur Coombs, one of the big Boston dealers, says about LAPS:—"We are extremely pleased with your System, and are confident that it will pay for itself within the next twelve months."



Here's the whole story

Coombs & McBeath selected LAPS as the most scientifically designed System from every angle.

They carry their stock in half the space formerly required.

They do more business with less help.

LAPS make a more rapid turnover of their stock.

They're proving that a LAPS System of Auto Parts Storage will pay for itself in 12 months.

David Lupton's Sons Company,
Detroit, Michigan.

Gentlemen:

We are enclosing, herewith, photographs of our Stock Room, after the installation of a Lupton System.

After a careful survey of all the Steel Bin Systems on the market, for the storage of Ford parts, we selected yours as the most scientifically designed system from every angle.

Our \$60,000.00 stock is now carried in 50% of the space previously used, and, due to the scientific layout of your system, we find it possible to do a greater volume of business with less help, and effect a more rapid turn over of our stock. The installation was made in our busiest season with very little interruption to our business, due to the fact that your Eastern representative personally supervised every detail of the work.

Frankly, we are extremely pleased with your system, and are confident that it will pay for itself within the next twelve months.

Very truly yours,
ARTHUR COOMBS & McBEATH, Inc.
Arthur Coombs

AC/7

Put in a
Lupton Auto
Parts Storage System
and you will be equally convinced of its investment value.

DAVID LUPTON'S SONS COMPANY

Main Office and Factory PHILADELPHIA.

Sales Office, 2631 Woodward Ave., DETROIT



Is this your vision of inventory and tax returns?

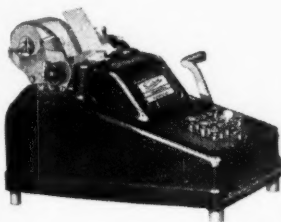
Do you dread the ordeal of computing column after column of handwritten figures for days at a time to arrive at accurate results for inventory and tax returns? You know what a nerve-racking, tiresome job it is to attempt to restore order from a veritable chaos of such figures.

You spend hours—perhaps days—that can be saved. Let a Sundstrand machine do the heavy work. Any of the machines described below will simplify your work, save much valuable

time, and assure absolute accuracy all along the line. Furthermore, through the easy accessibility to accurate figures, the *real facts* of your business will be at your command any time during the year. It will not be necessary to wait until the end of the year to find out where you stand.

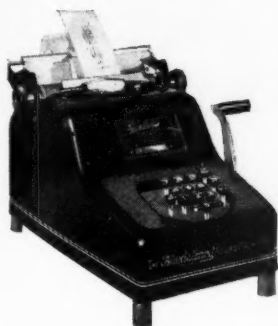
Let the local Sundstrand man demonstrate these machines in your office and discuss with you which will best fit your requirements.

Marvel Model No. 20



The adding and figuring machine that "set the pace" with 100 per cent printed proof and one-operation direct subtraction. The machine that combines these features with 10-key simplicity and speed, portability, convenient desk size, one-hand control, automatic-shift multiplication, adding, listing and figuring service. \$225 to \$275.

Special-Junior Adding and Figuring Machine



Unquestionably the greatest value ever offered in any adding and figuring machine. Gives adding and listing service PLUS direct subtraction and automatic-shift multiplication. Also 100 per cent printed proof, automatic column selection, simplicity and speed of famous 10-key keyboard, portability, desk size and one-hand control. All this at the extremely low price of \$150!

Automatic Cross-Tabulator

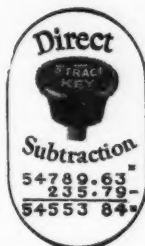
Combines ledger posting, statement making, stock record keeping and adding and figuring service in one simple, speedy, dependable machine at ONE low cost. Each item is added, non-added or subtracted, as required, and printed in the proper column of your record sheets automatically. Instantly converted for regular adding and other figure work with the famous direct subtraction feature. Double utility—one low cost. \$385—additional cost when equipped with motor.



Combination Cash Register and Adding Machine



Stops all guesswork about selling prices, sales by clerks and departments, cash sales, charge sales, money paid out, day's total sales and other figures vital to your business. Instantly converted for regular adding and multiplying. Has the famous Sundstrand speedy 10-key keyboard. In this machine you get double service at ONE low cost. Credit file furnished at slight extra cost.



SUNDSTRAND ADDING MACHINE COMPANY

Rockford, Ill., U. S. A.

Sales and service stations everywhere in the United States and foreign countries

Sundstrand

Adding, Figuring, Record-keeping Machines

"Re-Orders Tell the Story"

Re-orders are the one infallible sign of public approval. It is significant that many of America's largest and best known users of figuring machines have placed re-orders repeatedly for Sundstrand machines. In many cases the number of machines runs into the hundreds.

* * *

The local Sundstrand man will gladly demonstrate without obligation on your part. Mail the coupon or address Dept. M-2 for latest illustrated and descriptive literature.

Sundstrand Adding Machine Co., Dept. M-2.

Rockford, Ill., U. S. A.

Without obligation on our part, send latest descriptive literature concerning the machines checked below.

- | | |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------|
| <input type="checkbox"/> Special Junior Model Adding and Figuring Machine | <input type="checkbox"/> Cross-Tabulator Record-Keeping Machine |
| <input type="checkbox"/> Marvel Model No. 20 Adding and Figuring Machine | <input type="checkbox"/> Combination Cash Register and Adding Machine |

Name

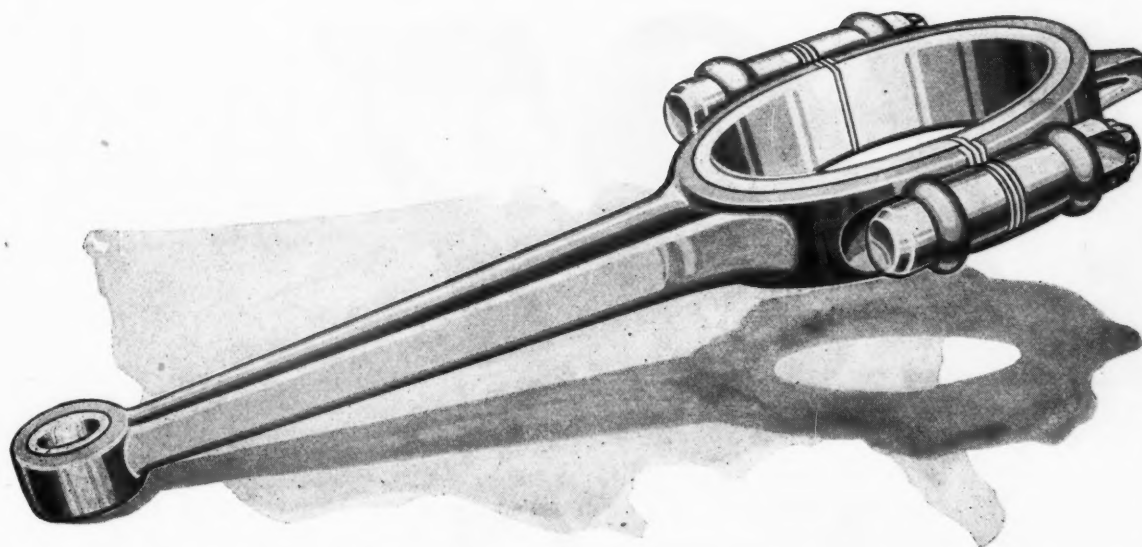
Address

City..... State.....

The World's Largest Builders of Six-Cylinder Automobiles



*When better automobiles are built,
Buick will build them*



When You Come to the End of a Perfect Reason

Pioneers in connecting rod rebabbiting service, the basic reason for the origin and existence of eighteen Watkins Rebabbiting Service plants is fittingly expressed in the words taken from an editorial in a recent issue of MOTOR:

"Service has made more rapid strides in the last few years than in all of the quarter century before, and just as the public measures car value so it has learned to measure service value. Neither does it expect too much for nothing. But it does decree fair prices for good work."

WATKINS One Day Rebabbiting Service from any of the following plants will help you to satisfy the car-owning public with prompt service—fair price—good work, because when you send your connecting rods to a Watkins plant, you know positively that you are going to get real service, and complete satisfaction.

WATKINS Rebabbiting Service consists of complete rod rebuilding—new bearings tinned and broached to mirror-finish. New bolts, nuts and Laminated Shims are supplied and bronze pin bushings if used.

WATKINS
Complete REBABBITTING
SERVICE

Send Parts to Factory Nearest You

Chicago, Ill., 57-61 E. 24th St.
Bergusson Skinner Corporation
Cleveland, Ohio, 5020 Euclid Ave.
Coful Auto Parts Company
Dallas, Texas, 3001 Commerce St.
Lawrence Process Company
Denver, Colo., 1818 Blake St.
J. A. Hingley Machine Company
Hartford, Conn., 28 High St.
Ripley Motor Services, Inc.
Indianapolis, Ind., 19-29 W. South St.
Indiana Watkins Manufacturing Co.
Kingston, Ont.
Watkins Mfg. Co. of Canada, Ltd.
Los Angeles, Calif., 1007 E. Ninth St.
Wright Manufacturing Company
Memphis, Tenn., 278 Washington Ave.
J. B. Cook Auto Machine Co.

New York, N. Y., 27-37 W. 60th St.
Lake Sales Company
Omaha, Nebr., 1006-10 Douglas St.
Interstate Machinery & Supply Co.
Portland, Ore., 14th and Everett Sts.
Factory Motor Car Co.
St. Louis, Mo., 4216 Easton Ave., H. & H. Machine Co.
Seattle, Wash.
Solon Grinding Company
Syracuse, N. Y., 201-211 Wyoming St.
Watkins Manufacturing Co. of New York
Toledo, Ohio, 1942 Putnam St. Stewart-Burgan Company
Washington, D. C., 1628 L. St., N. W.
R-L Motive Parts, Inc.
Waterloo, Ia.
All States Rebabbiting Service
Wichita, Kansas, Home Office
Watkins Manufacturing Company

Authorized Exclusively by Buick Motor Co. to Rebabbit and Rebuild Buick Rods

1107

New Chevrolets Sold in Chicago during the Auto Show

During the recent Chicago Automobile Show 1107 Chevrolet cars were sold at retail—a record never before equalled by any car exhibited at this show. In New York, during the Automobile Show, five times as many Chevrolet cars were sold as during any previous New York Show.

Attaining a position as the second largest automobile manufacturer in the world during the last few years through producing a quality car to sell at a low cost, Chevrolet this year offers far greater quality than ever before.

The public has been quick to realize this fact and, as a result, the Chevrolet Motor Company has broken all previous January records for retail sales.

A Chevrolet dealer franchise, this year, will be worth far more than ever before.

CHEVROLET MOTOR COMPANY, DETROIT, MICHIGAN
Division of General Motors Corporation

Touring— \$525
30 in. x 3½ in. Tires and
Artillery Wheels

Roadster— \$525
30 in. x 3½ in. Tires and
Artillery Wheels

Coupe— \$715
Balloon Tires and Disc
Wheels Standard
Equipment

Coach— \$735
Balloon Tires and Special
Artillery Wheels Standard
Equipment

Sedan— \$825
Balloon Tires and Disc
Wheels Standard
Equipment

**Commercial
Chassis— \$425**

**Express
Truck Chassis \$550**

Prices f. o. b. Flint, Mich.

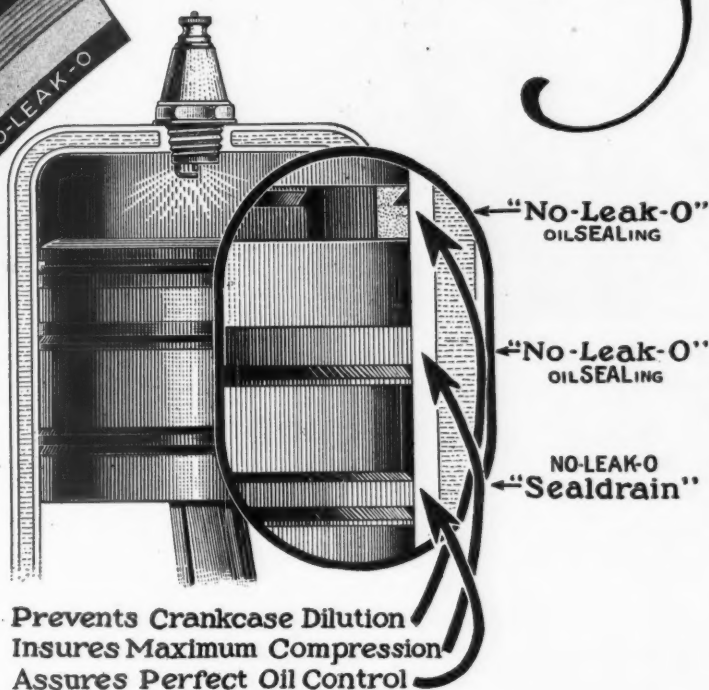


for Economical Transportation

Quality at Low Cost

The NO-LEAK-O SEAL DRAIN

Way



THE No-Leak-O Sealdrain way of installing Piston Rings as shown here successfully attains the object for which they are designed—the retaining of compression, at the same time preventing the dilution of crankcase oil.

The 45 degree angle OIL SEALING groove, (found only in No-Leak-O and Sealdrain piston rings) empties and fills with fresh oil on each piston stroke, and forms a packing or seal against oil pumping. For best results drill eight or ten $\frac{3}{32}$ in. evenly spaced holes just below lowest piston groove and at downward angle. Many replacement pistons are already so drilled.

Send for interesting literature.
Service Division—Oil Ring Department

The Piston
RING COMPANY
Muskegon, Michigan



An engine will not function more efficiently than its piston rings.

The No-Leak-O Sealdrain way makes it possible to get ALL of the power the engine is capable of producing.

NO-LEAK-O — SEAL DRAIN — QUALITY — DRAIN OIL

ZENITH

Zenith's Large Scale Production Reconciles Quality and Price



Looking down one aisle in the drill press department of the present modern, perfectly equipped Zenith factory.

ZENITH

CARBURETOR

There is a Zenith for every car, truck, bus, tractor, airplane, boat or industrial engine

CONSIDERING the fine workmanship and accuracy that goes into every Zenith part one might wonder how over 3000 Zenith carburetors could be produced in one day.

BUT if one could inspect the large Zenith factory and see the special machinery designed and built by Zenith, the reason would be plain.

SPECIAL machines, modern methods and efficient lay-out all make possible large scale production at a cost surprisingly low when the high quality of Zenith carburetors is considered.

ZENITH - DETROIT CORPORATION

Manufacturer of

ZENITH CARBURETORS

DETROIT

MICHIGAN

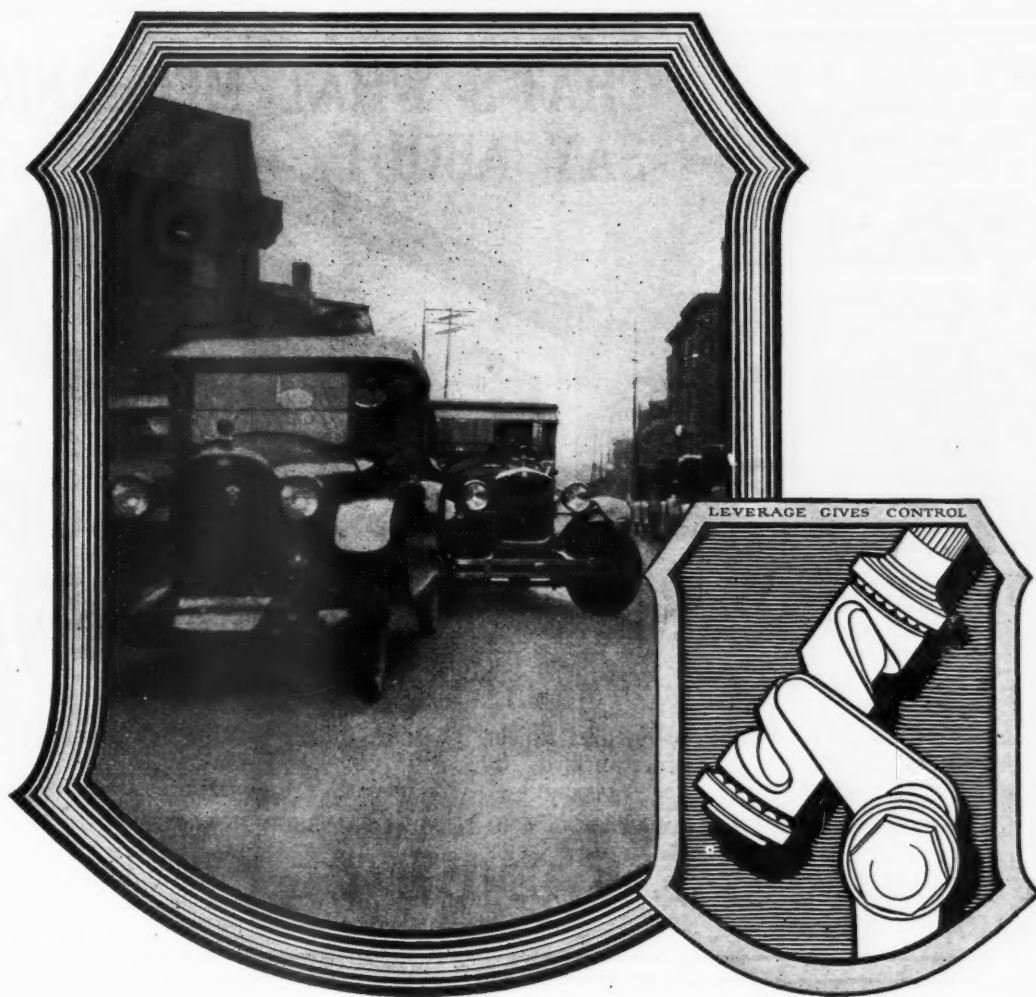
Branches:

NEW YORK

CLEVELAND

CHICAGO


Over 1000 Service Stations



When Action Counts!

YOU'RE bowling along in a line of traffic suddenly and without warning, the car just ahead of you *stops*. A quick swerve is imperative to avoid collision. With the Ross Cam and Lever Steering Gear you have the prompt response, ease, assurance and control to meet this and all emergencies. On any road—under all conditions—Ross supplies new and imperative steering advantages.

ROSS GEAR AND TOOL COMPANY, 400 Heath Street, Lafayette, Indiana

ROSS
CAM and LEVER  **STEERING GEARS**

EASIER STEERING LESS ROAD SHOCK

TRINDL PISTON PINS AND
VALVES MAKE A GOOD JOB
THEY BRING ME BUSINESS



AND THAT'S WHY
JOBBER SELL
THEM EVERYWHERE

THAT'S WHAT MECHANICS
SAY ABOUT

TRINDL
PISTON PINS
and
WARP PROOF VALVES

They are absolutely perfect in workmanship and finish. They are marked with stock number and oversize. No chance for mistakes. Pins are made in standard, .003, .005, .010, .015 and .020 oversize. Valves are made in standard, .015 and .031 oversize. You can't go wrong with Trindl products.

WRITE FOR COMPLETE CATALOG AND NAME OF JOBBER NEAREST YOU

THE TRINDL CO.

2917 S. WABASH AVE.

CHICAGO, ILL.

Reconditioning Time is Nearly Here— Are You Prepared to Profit?



F-J Cylinder Reamer—Does the work of a \$3,000 machine.

Equip your shop with the Foster-Johnson family of reconditioning tools and you can successfully handle all those big profitable jobs that you otherwise have to pass on to others. Write for the F-J Station Manual, Catalog and full particulars.

FOSTER-JOHNSON RECONDITIONING TOOLS

F-J Cylinder Reamers

F-J Cylinder Hone

F-J Reamer Sharpener

F-J Connecting Rod Re-
Boring Fixture

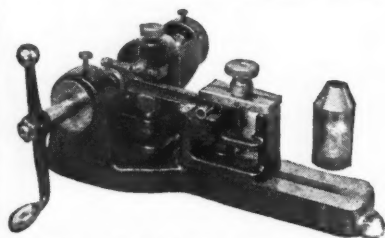
F-J Piston Aligner

F-J Connecting Rod
Straightening Vise

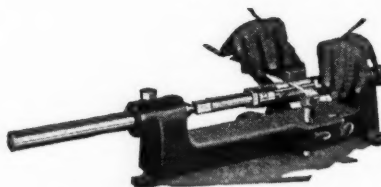
Kylin General Purpose
Reamers

FOSTER-JOHNSON REAMER CO.

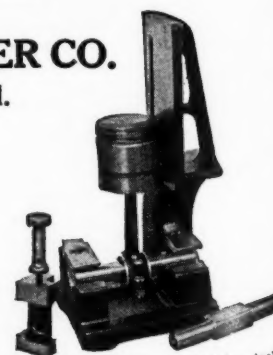
1328 Beardsley Ave., Elkhart, Ind.



Connecting Rod Re-Boring Fixture.



Reamer Sharpener—for servicing reamers
in the shop.



Piston Aligner—A precision tool.

AUCTION

In the Matter of

J. C. WILSON COMPANY

Corner of 15th and Warren Ave., Detroit, Mich.

Manufacturers of

Wilson "Dependable" Motor Trucks

DANIEL H. SILVA, Receiver

Slyfield, Hartman & Mercer, Attys. for Receiver

By Order of the Circuit Court for the County of Wayne in Chancery, in the State of Michigan, we will sell at Public Auction on

TUESDAY, FEBRUARY 17th, 1925

At 10:30 A. M. Eastern Standard Time

The following assets, Inventory value over
\$60,000

Exclusive of Real Estate

Consisting of Iron and Wood Working Machinery as follows: Milwaukee No. 1B Plain Miller; Kelly 16" Crank Shaper; Monarch Engine Lathe; Drill Presses; Grinders; Davis Vertical Key Seating Machine; Monarch Saw; Niagara Sheer; Arbor Press; Tire Press; Woodworking Machinery, etc.

Miscellaneous: Blower, Fan, Anvils, Forge, Heating Furnace, Chain Hoists, Triplex and Cyclone also 1100 ft. Overhead Trolley Track, etc.

MOTOR AND AIR COMPRESSORS: 10 Western Electric 1 to 30 H.P. 220-volt 3-phase motors; DeVilbiss Air Compressor; Curtis Vertical Duplex Air Compressor 175 cu. ft. capacity with High Pressure Air Tank; and miscellaneous hammers and drills.

AUTOMOBILE TRUCKS and PARTS: 1 Model B 1-ton Wilson Delivery Truck; 1 2-ton Reo Truck; 1 Ford Delivery Truck.

Fifty Lavine 1½-ton L.K. Steering Gears; 105 Ross 1½ to 3½-ton R.H. Steering Gears; 6 Brown Lipe 2½-ton Control Sets; 950 sets Front and Rear Springs for 1½ to 5-ton Trucks; 1000 Front and Rear Spring Brackets, Clips and Shackles; 10 Front and Rear Timken Axles for 2½, 3½ and 5-ton Trucks; 500 Front and Rear Wheels, sizes 34x4½, 36x4, 36x5, 36x6, 38x7 and 40x6, for Savage, Wisconsin and Sheldon. Timken Axles and assortment of Firestone Demountable Rims. Over 25 tons of other Truck parts and large selection of nuts, bolts, screws, rivets, etc., too numerous to mention.

TOOLS: High Speed Twist Drills, Reamers, Milling Cutters, Lathe Tools and Chucks, Machinists Bench Vises, Surface Plates, Whitney Keys, Washers, Floor Trucks, Stock Bins and Cupboards, Platform Scale, Belting, Pulleys, Shafting, Hangers, etc.

GOOD WILL AND SERVICE: Consisting of trade name, patterns, blue prints, orders on hand if any, list of customers and everything pertaining to continuation in business. Approximately 1500 trucks have been built. Also Repair and Service Department.

OFFICE FIXTURES COMPLETE.

REAL ESTATE

We will also offer 3 modern factory buildings totaling approximately 50,250 square feet of floor space.

THIS SALE TAKES PLACE AT 15TH AND WARREN AVENUE, DETROIT, MICHIGAN

DANIEL H. SILVA, Receiver

Slyfield, Hartman & Mercer, Attys. for Receiver

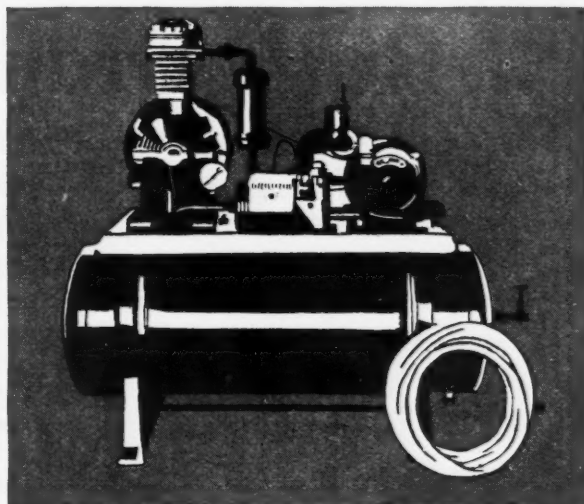
Gordon & Winternitz Co., Inc.

Expert Commercial Auctioneers

303-4 Fine Arts Bldg. Detroit, Mich.

Phone Cherry 9428-9

Descriptive Circulars will be mailed upon request



We do the job well!

We know what it takes to put a job on your floor and make it stay put. We've got good men designing and making air-compressors. They know exactly how and where to add that extra bit of excellence that spells satisfaction. They turn out a good job, and no excuses go. We'll take our chance of selling it afterward, and we've found that it's no trouble to take a job that is right in its engineering and sound in its construction, and sell it. And make it stick. Our prices are reasonable. We furnish first-class service. Our products meet the demands of modern business. If you want to stock and sell them, write us. If you are in the market for any of our products, fill out, sign, and mail the attached coupon today.

Quincy Compressor Co.

Name formerly

Wall Pump & Compressor Co.

217 Maine St. Quincy, Ill., U. S. A.



QUINCY COMPRESSOR CO.,

217 Maine St.,

Quincy, Illinois.

Please send me further information about the equipment you advertise.

Name..... Street.....

City..... State.....

Rush Orders Welcomed!

When you want springs in a hurry go to the Tuthill jobber.

We keep him always well supplied with stock models of a wide variety of types and sizes.

Where special jobs are necessary for replacements on obsolete cars or trucks we can turn them out in thirty-six hours or less. We have recently completed a large Service Plant exclusively for rush orders. That's why they're always welcome!

TITANIC SPRINGS

Alloy Steel Throughout

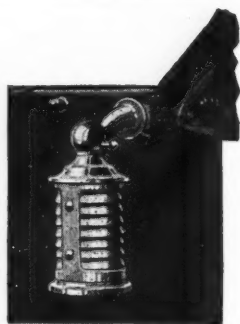


TUTHILL SPRING COMPANY

760 Polk Street

Chicago, Ill.

Quality Spring Builders for Forty-Five Years



No. 75

"Paul Revere"

—Something Different
in Parking Lamps



This lamp is produced for those owners who are constantly on the lookout for something distinctive—and we have found that there are a great many of them.

No. 75 "Paul Revere" is primarily a parking lamp. When supplied with a double filament bulb and the Victor stop lamp switch it becomes a combination parking, stop and courtesy lamp. Attached to open cars by screwing it to the top-bow stud in place of the nut.

No. 76 "Paul Revere," a duplicate of No. 75, is made for mounting on the fender.

Literature and prices on these and other Victor products will be furnished on request. Write for them now.

The CINCINNATI-VICTOR CO.
714 Reading Road Cincinnati, Ohio

The Victor Line



Flexible Twist

Hollow flexible Steel
Twist for all purposes

We make bearings out of it
—you can use it for hose,
tubing, handles, shafting and
any other purpose that re-
quires hollow flexible tubing.

All sizes and metals.

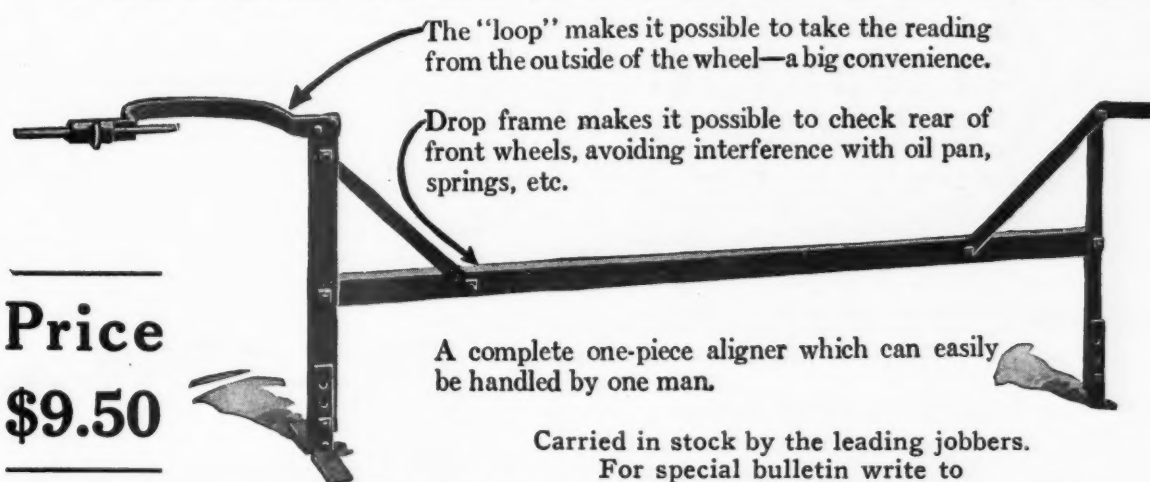
We invite your correspondence.

ROLLER BEARING CO.
OF AMERICA

Frelinghuysen Ave., Hunter St.,
Newark, N. J.

Get a Manley

WHEEL ALIGNING GAUGE



A complete one-piece aligner which can easily be handled by one man.

Carried in stock by the leading jobbers.
For special bulletin write to

MANLEY MFG. CO. York, Pa.

Get **Tom Smith**
for this car

THROUGH
**COMFORT
PROSPECT
CARDS**

A PROVEN, practical card record that gives you all the facts about your prospects and guards against the little slips and trips that spoil many a sale.

Send for sample cards and see how they will fit right into your every-day business plans.

COMFORT
PRINTING SPECIALTY CO.,

101 N. 8th Street, St. Louis, Mo.

FORM 72 PROSPECT CARD

NAME Tom Smith SALESMAN Heber

RESIDENCE 1452 Shawmut St. PHONE Cal 652 DATE 1-11

BUSINESS 107 No Eighth St. PHONE 06995 INTERESTED IN Touring

CAR OWNED Ford MODEL 1916 PRESENT VALUE 225.00

HOBBIES Base Ball BEST TIME & PLACE TO SEE Office A.M.

CALLS	DATE	INTERESTED	ASKED FOR DEMONSTRATION	CHANCE TO CLOSE	DATE TO CALL	REMARKS
1	1-16	Yes	No	good	1-21	
1	1-21		Yes		1-23	
1	1-23		Yes	good	1-27	Expects money in few days. Will close.
1	1-27				2-1	

DATES LITERATURE SENT 1-15

DATE CAR SENT 2-1

COMFORT PRINTING SPECIALTY CO. ST. LOUIS MO.
(ALL RIGHTS RESERVED)

MORRISON

AUTOMATIC DOUBLE RANGE
Worm Drive
JACKS



Made in 9 sizes for
all service require-
ments. Special model
for Balloon Tires.

Can't slip or tilt

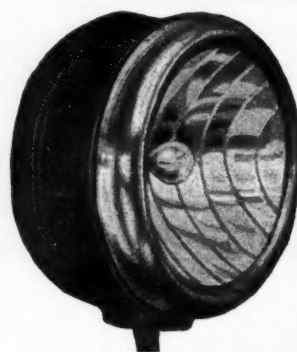
The flexible steel "Sure Hold" cap prevents dangerous slipping. The long folding handle (36" to 72") operates from standing position.

High class construction throughout. Vanadium steel gears and standard make bearings.

Write for sample for test.

Woods Engineering Co.
Alliance, Ohio

This Jack has been furnished as standard equipment on high class passenger cars, trucks, buses and fire engines for the past 4 years.



**Sell Flatlite
as a Reflector
or as a
complete
headlamp**

Replacing with Flatlite Headlamps not only provides good lamps but light itself that is legal in all states because it is powerful without glare. You can also sell the Flatlite Reflector for installation in any standard headlamp. The Flatlite Reflector will make it a safe light for night driving.



Flatlite is fast becoming the national headlight. The second million is now being sold. Dealers and jobbers everywhere are reporting remarkable success. We have their unsolicited letters and can show you this proof on the popularity of Flatlite Headlamps and Flatlite Reflectors. Write today for our sales plan. We have some good territory still open.

The American Flatlite Company

Department A

Reading Road at Dandridge Street, Cincinnati, Ohio

Flatlite

Makes Window Glass a Legal Lens

The Better Drills

A Size and Type for Every Purpose

You can afford to be more particular in the purchase of a drill than with any other tool.

THOR UNIVERSAL Electric Drills are built to be better than the ordinary—a drill you will swear by, not at. You will prize your THOR.

It will be a source of profit to you and give service without requiring service.

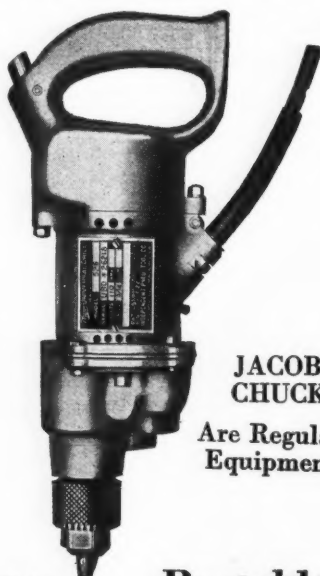
*Send for the new
THOR book of drills*

**INDEPENDENT
PNEUMATIC
TOOL CO.**

Branches Everywhere

CHICAGO:
600 W. Jackson Blvd.
NEW YORK:
1463 Broadway

Thor



**JACOBS
CHUCKS**

Are Regular
Equipment

**Portable
Electric
Drills**

**Only
20c
each**

Genuine APEX Innerings

We don't know of another item, at so small a cost, that accomplishes so much.

Genuine Apex Innerings are positively guaranteed to stop oil pumping, piston slap and reboring expense.

Write today for full information. Car owners will be interested in learning of the small cost required to put their motors in first class shape—and—dealers will be glad to learn of our proposition that makes big profits for them. Write:

Thomson Mfg. Co., Dept. C, Peoria, Ill.



"If it isn't an APEX—it isn't an Innering"

"WHITNEY"

SILENT HIGH MILEAGE CHAINS

VITALITY

Any motor out of time, is practically out of business, because "timing" is its spark of life,—its vitality.

A "WHITNEY SILENT HIGH MILEAGE CHAIN" for camshaft and generator drives, is the most dependable mechanism that can be used for such purposes.

"WHITNEY SILENT HIGH MILEAGE CHAINS" for timing and accessory shafts are stocked in all principal cities. The dealers listed below will handle all of your chain replacements with these trouble-free chains of extraordinary long mileage.

Authorized distributors listed below.

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|--------------------------------------------------------------------------|---------------------------------------------------------------------------------|
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Birmingham El. Batt. Co.
Av. B. and 21st St. | New York—New York City
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Crow-Burlingame Co. | New York—Buffalo
Roth & Zillig, Inc.
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| California—San Francisco
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615 Howard St. | New York—Rochester
Sidney B. Roby Co.
208 South Ave. |
| Colorado—Denver
Auto Elec. & Appl. Co.
W. 13th Ave., Acoma St. | New York—Syracuse
Syracuse Auto Supply Corp.
311 So. Warren St. |
| Georgia—Atlanta
Alexander-Seewald Co.
81 N. Pryor St. | Ohio—Akron
The Hardware & Supply Co.
475-535 South High St. |
| Indiana—Indianapolis
Gibson Company | Ohio—Cincinnati
Auto. Bear. & Equip. Co.
205-207 E. 8th St. |
| Iowa—Des Moines
Brackett Co.
545 Fifth St. | Ohio—Cleveland
Auto. Bear. & Equip. Co.
7823 Carnegie Ave. |
| Kansas—Wichita
E. S. Cowie Electric Co. | Ohio—Toledo
Hawley Sales Co.
624 Jefferson Ave. |
| Louisiana—Monroe
Monroe Auto Supply Co. | Oklahoma—Oklahoma City
Harrison Smith Co.
711 No. Broadway |
| Maryland—Baltimore
J. R. Hunt & Co.
Calvert & Saratoga Sts. | Pennsylvania—Altoona
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1110 15th St. |
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Auto Equip. & Ser. Co., Inc.
1421 No. Broad St. |
| Massachusetts—Springfield
E. B. Atmus Co.
113 Chestnut St. | Pennsylvania—Pittsburgh
Pittsburgh Auto Equip. Co.
5933 Baum Blvd. |
| Michigan—Detroit
Auto Elec. & Ser. Corp.
91 Selden Ave. | Tennessee—Memphis
Mills-Morris Co.
372 So. Main St. |
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E. S. Cowie Electric Co.
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Harrison Smith Co.
2018 Jackson St. |
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A. H. Coates Co.
1115 East Union St. |
| Missouri—Springfield
Ozark Motor & Supply Co.
308 S. Jefferson St. | Wisconsin—Milwaukee
Lemke Electric Co.
505 Cedar St. |
| Nebraska—Omaha
Auto Elec. & Radio Corp.
2813 Harney St. | |

These Distributors make it easier for you to use
"WHITNEY SILENT HIGH MILEAGE CHAINS"
on all replacements

THE WHITNEY MFG. CO.
HARTFORD, Connecticut

The Mechanic's Friend



Joints 100% Tight

The easy and sure way to end all your leak troubles is to use KEY Graphite Paste.

Any screw connection—any gasket installation—any hose joint—can be made 100% leak proof or compression tight with this paste.

Used on battery terminals it prevents corrosion and stops sulphation and makes easy disconnecting when necessary.

KEY Graphite Paste

At a temperature of 212° it expands and fills every little hole and crevice and STAYS THERE. Gasoline will not affect it. It's the mechanic's friend.

A big selling staple for jobber and dealer!

KEY BOILER EQUIPMENT CO.

27th & McCasland Ave.

East St. Louis, Ill.

A SAMPLE CAN FREE
KEY BOILER EQUIPMENT CO.
27th and McCasland Ave.,
East St. Louis, Ill.

Please send me, without charge or obligation, a sample can of Key Graphite Paste.

NAME

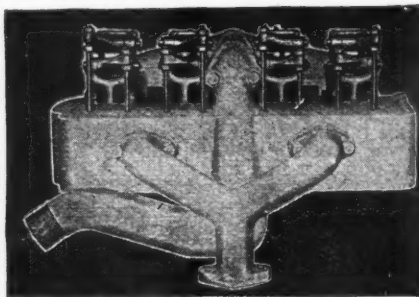
BUSINESS

ADDRESS

JOBBER'S NAME

M.A. 2-12-25

ROOF 16 OVERHEAD VALVE EQUIPMENT For Ford and Dodge Motors ROOF 8 VALVE HEAD FOR FORD MOTOR



Stupendous Power— Lightning Speed

Ford racing cars with Roof Equipment are rivals on mile and one half mile tracks of the highest priced racing cars. Doubles the pulling power of the Ford or Dodge pleasure car or truck. Hill climbing and general road work beyond wildest dreams of the owner. Complete—ready for installation—no machine work necessary. We are headquarters for all speed equipment. No matter what you want, write us. Racing quality—lowest prices. A postal card brings you complete list of our specialties.

Jobbers—Dealers—Consumers—Write Us.

THE LAUREL MOTORS CORPORATION, ANDERSON, INDIANA

SKIVED PATCHES

Cord and Fabric

Any Size or Ply—Made from Factory
Adjustment Tires.

THE LEO MEYER CO.
AKRON, OHIO

Est. 1914

TIRES

TUBES

ACCESSORIES

No Chatter, No Digging In Smooth, Round Holes, Twice Ordinary Expansion, Extra Long Pilot, Money-back!



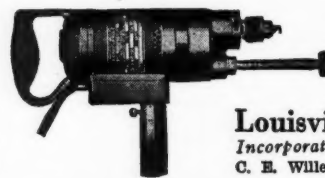
Each blade of a PAROB Reamer cuts at a different angle. Cuts absolutely smooth, round holes. Twice the expansion of ordinary reamers. Screwdriver adjustment. No exposed locking devices. Honed as easily as any straight-fluted reamer. Burr cutter on end of pilot.

Made in all sizes. Can be made in multiple series. Ask about Gammons Taper Pin Reamers. They reduce costs of reaming for taper pins two-thirds. Price list mailed to all.

**PAROB EXPANSION
HAND REAMER**
THE GAMMONS-HOLMAN CO.
DEPT. C, MANCHESTER, CONN.

Get This "Pioneer" \$65 Garage Special

Electric Drill
and Valve Grinder

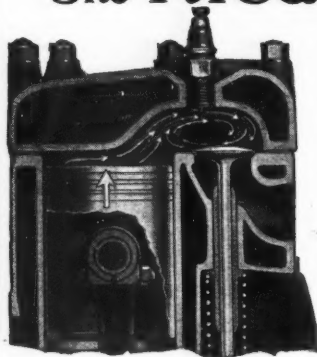


Greatest time and money saver, as well as money maker, for your shop—

"It Will Do The Work"

Louisville Electric Mfg. Co.
Incorporated
C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.

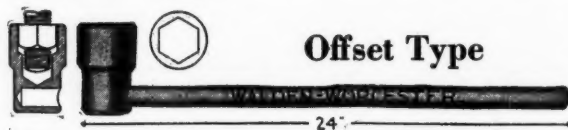
The Ricardo Head



At all speeds and at all loads—increased economies, increased performances, and complete absence of fuel knock demonstrate the true importance of the Ricardo Head.

**WAUKESHA
Motor Company**
ENGINE BUILDERS
Waukesha, Wisconsin
New York, N. Y.

Heavy Duty Socket Wrenches



Offset Type

Extra strong construction with extra depth sockets—heat treated.

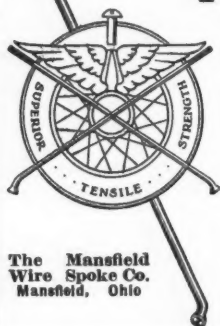
Plain lacquer finish—twenty-eight standard sizes.

Ask for Catalog No. 400.



WALDEN - WORCESTER
INCORPORATED
WORCESTER, MASS.

Replacement Spokes for Wire Wheels of All Makes



Genuine Mansfield Wire Spokes are made from new process of swaging, threading, and heading. New improved design reduces strain on shank and thread. Immediate deliveries to parts jobbers and service stations.

**MANSFIELD
WIRE
SPOKES**

The Mansfield
Wire Spoke Co.
Mansfield, Ohio



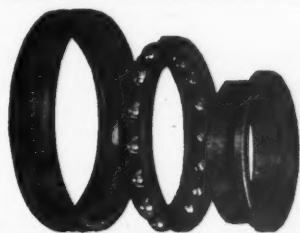
**POWERSTEEL
AUTOWLOCK**

PORE-BLOWN BATTERY PLATES

FREE Catalogue.
Get our informative catalogue and hand-book on plates and all battery parts.

Pore-Blown Plates do the winter job better than any other plates, because they have greater capacity. They also have re-enforced grids and the materials that go into the paste are pulverized (not just mixed).

GENERAL STORAGE BATTERY CO.
2005 Locust St. St. Louis



Services of our Engineering Department are at your command at all times on layouts where Angular Contact Radial Bearings or Angular Contact Thrust Bearings are used. Our experience is broad and covers many years. When may we be of service to your organization?

The Bearings Company of America
Lancaster, Penna.

Western Sales Office,
1012 Ford Bldg.,
Detroit, Mich.



"IDEAL"

Assortment of
COTTER PINS

Packed in a practical size, round screw-top box, attractively and fully labeled. Containing 100 assorted Cotter pins ranging from 1/16"x1/2" to 5/32"x1-1/2". This is the standard automobile assortment.

We also make the well known W. W. Assortment in Leatherette covered cases as well as assortments for Agricultural Implements and Hardware requirements. We manufacture all sizes of Cotter Pins—Steel and Brass.

Ask your jobber for the W. W. Line

WESTERN WIRE PRODUCTS COMPANY
St. Louis, Mo.

BIG SELLER

An article that is an absolute necessity to every battery owner surely has a big field. Nearly 15 million batteries in service. NON-KOROD is an enemy of corrosion and sulphation. Preventing these leaks and battery deterioration makes NON-KOROD very valuable. Car owners will appreciate it at the small price per can.

Jobbers and Dealers write for literature and selling plan



**NATIONAL CABLE
COMPOUND CO., Inc.**
MITCHELL, INDIANA

Non-Korod
GUARDS
BATTERY LIFE



Five Tools in One

The
most versatile
little tool
you ever saw

Order thru your jobber
PACIFIC RIM TOOL CO.
16606 Waterloo Road
Cleveland, Ohio

2339 11th Ave. N. Seattle, Wash. Export Office
258-259 Broadway New York City

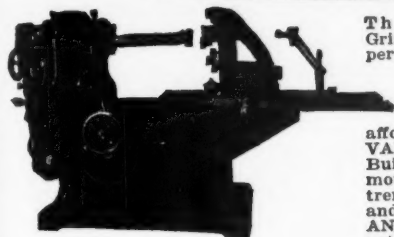
U.S. Air Compressors

Made in many sizes to meet any and all requirements in garage, tire repair shop and filling station. Six types: Two Stage, Single Stage, Air Cooled, Water Cooled, Stationary, Portable. Our low prices enable you to get a Compressor for a small investment.

Send for literature.

The United States Air Compressor Co.
5304 Harvard Ave. Cleveland, Ohio

LANDIS

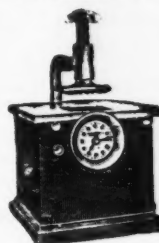


The LANDIS Cylinder Grinding Machine is the perfected product of the world's largest exclusive grinder builders. Because of our volume we can afford to give you MORE VALUE for your money. Built expressly for automotive repair shops. Extremely simple in design and operation. Don't buy ANY machine without first getting a LANDIS quotation. Catalog.

Landis Tool Co., Waynesboro, Pa.
New York Office—30 Church St.

FOLLETT'S NEW MODEL TIME STAMP

—accounts for every labor minute



Prints the year, month, day, hour, minute, A. M. or P. M. at the exact moment the plunger is pressed—like this, for example:

NOV 19 1920 4 31 PM

Tells when a job is started—and when it is finished. There can be no dispute over the time charge.

Absolutely automatic—except for winding. Every machine guaranteed.

Follett Time Recording Co., 217 High Street, Newark, N. J.
"Established Since 1904"



UNIVERSAL HOSE CLAMP

Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.

UNIVERSAL INDUSTRIAL CORP.

Hackensack, N. J.

Let us send you our FREE Catalogue on

Huetter's Fly-Wheel Gear Bands

Huetter Machine & Tool Co.

546 Kentucky Ave.

Indianapolis, Ind.



C. & G. WHEEL PULLER

IT DOES THE BUSINESS!
WHAT?

Pulls the hardest ones as easily as the others pull the easy ones.

Ask your jobber or write us.

The C. & G. Wheel Puller Co., Inc.
Wellsville, N. Y.

EATON

BUMPERS ▼ AXLES ▼ SPRINGS

Factories: Cleveland, Pontiac, Albany
Branches: New York, Boston, Chicago, Philadelphia, Cleveland
Detroit Office: General Motors Building



\$1.25
RETAIL

No Wonder They Sell Fast

Tasco Gasoline Gauge takes the place of the filler cap and saves the mean job of "measuring" the gas in the tank. For Fords, Chevrolets and Overlands.

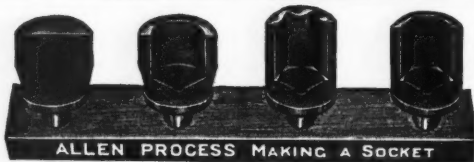
THE AKRON-SELLE CO., Akron, Ohio, U. S. A.



THE GOODRICH-LENHART MFG. CO., Hamburg, Pa.

Goodrich Cable is sold in lengths found to be the most popular with the average buyer—coils of 100 ft. packed in individual cartons. Both shop men and car owners like the clean 100 ft. package idea—and this leads to quick and profitable sales. Send for samples, prices and discounts.

Cold-Drawn Sockets



ALLEN Wrench Sets

The Allen Manufacturing Company, Hartford, Conn.

Lorentzen Headlight Kontrol

AN AUTOMOTIVE NECESSITY THAT SELLS

LORENTZEN HEADLIGHT KONTROL, INC.
60 Grand St. New York City



Electrolock

YOU CAN'T FORGET TO LOCK IT

For FORD Cars

Automatic, safe and positive protection against theft. Approved by Underwriters' Laboratories. Earns lowest theft insurance rate. Mitchell Specialty Co., Philadelphia, Pa.



ACCURATELY MACHINED

REPLACEMENT PISTONS

Semi-steel—for use after a rebores or re-grind job. Made to manufacturer's specifications. Made to pass motor builder's inspection. Standard sizes and oversize. Write for price list.

THE DALL MOTOR PARTS CO.,
P. O. Station D, Cleveland, Ohio



Lycoming MOTORS



Fine Fours, Sixes and Eights-In-Line

LYCOMING MFG. CO.

WILLIAMSPORT, PA.



Visible Night and Day SAFE-T-STAT

ENGINE HEAT INDICATOR
Always Accurate Theft-Proof

The Safe-T-Stat Co., Inc.

79-85 Bridge Street

Brooklyn, New York



Curtis Pneumatic Machinery Co.

1527 Kienlen Ave.
St. Louis, Mo.



\$7

THE "Universal" Model (left) and the "Junior" Model (right) are the two automatic windshield cleaners you can depend upon for steady sales with no "come-backs."

The Folberth Auto Specialty Co.
Cleveland, Ohio

FOLBERTH Automatic WINDSHIELD CLEANER



\$5



Carbon Removing Brush

The quick, easy way to remove all carbon deposits, B66, heavy wire for rough surfaces; B67, fine wire for machined surfaces and aluminum pistons. Used with small electric drill or Sioux Flexible Shaft.

Ask Your Jobber

ALBERTSON & CO.

SIoux CITY, IOWA



Thirty-seven BRANCHES

AHLBERG BEARING COMPANY
321 EAST TWENTY NINTH STREET, CHICAGO ILLINOIS

NO TOOLS—It's Self-Closing



Repair Link for Broken Cross Chains
A Flower City Self-Closing Link attached with fingers to loose ends of broken chain closes and locks on first turn of wheel. Stops clanking—saves fender—low-priced. Box of 10 Links retails for 25 cents. Write for samples and discounts. Distributors wanted.

FLOWER CITY SPECIALTY CO. Rochester, N. Y.

MONOGRAM ORIGINAL SELF LOCKING RADIATOR CAP

GENERAL AUTOMOTIVE CORP., 600 W. Jackson Blvd., CHICAGO

Packard Cable
The Packard Electric Co.
Warren, Ohio



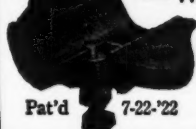
RAMCO CUSHION INNER RINGS

fit behind piston rings and keep them in perfect contact with the cylinder walls at any motor speed or temperature.

RAMSEY ACCESSORIES MFG. CORP., ST. LOUIS, MO.

TAKE THE END-PLAY OUT!

—WITHOUT PULLING THE MOTOR



THE C. A. ADJUSTABLE CENTER BEARING CAP corrects Ford crankshaft end play and sets magneto for highest efficiency without removing the motor. Easily and quickly installed. Guaranteed for one year. List price \$3.75. Ask your jobber or dealer or write us direct.

Pat'd 7-22-'22

ADJUSTABLE BEARING CO., Inc.
Dept. M. Brazil, Indiana

Johns-Manville ASBESTOS BRAKE LINING

For Dependable Air

Use a
FRANKLIN SUPER-SINGLE-STAGE AIR COMPRESSOR
FRANKLIN AIR COMPRESSOR WORKS
2602 Main St. Norristown, Pa.



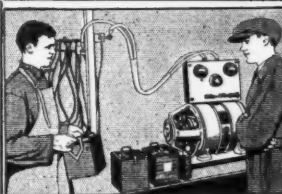
TIMKEN Tapered ROLLER BEARINGS

\$2.00
Retail

Life Timer
for Fords

Needs no oil. Short proof. Fool proof. Wipes a perfect contact regardless of wobble in the shaft. Bakelite Commutator is reversible, giving 2 timers for the price of one. Sold through the jobber. Write for folder and discounts.

Mechanical Production Co.
MILWAUKEE, WIS., U. S. A.



YOU CAN CLEAR \$150 to \$300 PROFIT EVERY MONTH
with New HB 8 Hour Battery Charging Outfit. HB Users everywhere are adding \$150 to \$300 monthly to their income. Outfit comes complete with all necessary equipment for only \$35 cash. Small monthly payments. Free trial on moneyback guarantee. Write for free bulletin 250. **HOBBART BROTHERS COMPANY**
Box A 25 Troy, Ohio

8 HOUR BATTERY CHARGING PAYS BIG

REPAIRMEN

Here's a new source of profit!

Send us your rewind jobs. We are "Armature Winding Specialists."

Profit for you in our service. Ford generator armature rewind—\$1.95. Other prices in proportion. All work guaranteed. Write for catalog and prices on all generators.

H. M. FREDERICKS CO., Lock Haven, Pa., U. S. A.



The Money-Making Line— WILLYS-OVERLAND Fine MOTOR CARS



Pump Shaft Leaks Permanently Repaired

Conneaut Plastic Metallic Packing makes a smooth metal bearing for pump shafts. Practically frictionless. Adjustable like a bearing. In one and 5 lb. cans. \$1.65 a pound. A really wonderful packing producing exceptional results.

Conneaut Packing Co., Conneaut, Ohio

Dealers
Every
Where

INSIST UPON



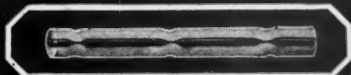
Millions
Now
In Use

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"REQUIRES ONLY HEAT"



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The **AERMORE**
Exhaust Horn



The Signal with a Smile

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Spring-steel, Oil-tempered Bumpers in Six Complete Styles. Guaranteed Satisfactory Attaching Arms for all Leading Makes of Cars.

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BIG GAS SAVING

With the CYCLO "Dynamic" Hot-Spot for Fords.

Automatic heat control keeps the "kick" in the mixture.

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3,000 Dealers Make Bigger Profits



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Write for the Book
"AIR PROFITS"

describing many new uses for compressed air. Shows how to make an air compressor earn greater profits.
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Kokomo Long Life tires and tubes make money for dealers who handle them.

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Kokomo Two-Grip Cords
Kokomo Everlast Red Tubes
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Regular, Oversize, Orphan
Shipped Same Day

ELGIN MACHINE WORKS

Elgin, Ill.

The New

BETHLEHEM MOTOR TRUCKS

1 Ton, 2 Ton, 2½ Ton, 3½ Ton

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—is tough and long-wearing—not easily damaged by heat, oil, vibration or radiator compounds. Sold in cut lengths for Fords and 3-foot lengths, all sizes with inch markings.

EKLA prices allow unusual profits to the trade.

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After using Hall Hones for over one year Buick test out the New Hall Hone and approve of it. It is the only Hone endorsed by Buick.

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AND SHOP
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MANUFACTURING
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Pulls Car Over Rough Spots

No friction—no springs—
no oiling. For Fords—solid Drop
Forging—\$24.00.

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FORD
ARMATURES
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\$2.00



MOST ANY
TWO UNIT
GENERATOR
ARMATURE
\$5.00

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Big money in this service

Dealers and shops make big money through the control of a franchise which entitles them to the exclusive use of the patented "KLEAN RITE" system of washing and polishing automobiles. This system has turned a job into an impressive, highly profitable business.

Write for full particulars

Klean-Rite Auto Laundry Company

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JOHNSON Gas Appliances

Metal-Melting Soldering Heat-Treating

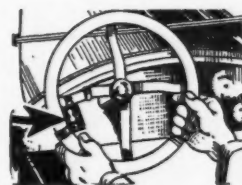
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Move the thumb and lights are dim! Attached to steering wheel in 15 minutes. A low-priced convenience. Safety factor.

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Style A for headlights—\$1.75. Style B for headlights and spotlights—\$3.00. Big discounts—Write.

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ALMOND "STRAIGHT LINE" DRILL CHUCKS

When buying Portable Electric Drills be sure to look for the distinctive ALMOND CHUCK, which may be easily identified by the "STRAIGHT LINE" milling on the chuck body.

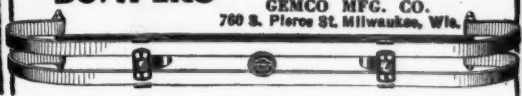
Write for complete information regarding the new ALMOND "STRAIGHT LINE" CHUCKS.

T. R. Almond Mfg. Co., Ashburnham, Mass., U. S. A.

Gemco
BUMPER

Tempered and nickel plated by our own exclusive processes. Maximum strength, lasting beauty of finish. Write for catalog.

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Stevens SPEED UP Tools

OVER 100 ACCURATE SHORT-CUTS
TO GOOD WILL AND PROFIT
"Thru your jobber—his service is economy"

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BOOKLET FREE HIGHEST REFERENCES
PROMPTNESS ASSURED BEST RESULTS
Send drawing or model for examination
and report as to patentability

WATSON E. COLEMAN, Patent Lawyer
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Attorney-at-Law and Solicitor of Patents
C. L. PARKER

Formerly Member Examining Corps, United
States Patent Office

American and foreign Patents secured. Searches made
to determine patentability and validity. Patent suits
conducted. Pamphlet of instruction sent upon request.
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The largest stock of new and used car and truck
parts in the world. We have everything. Always
mention model and serial number in order. Write
us. All inquiries answered promptly.

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DOWMETAL PISTONS

Lighter, stronger, and longer wearing than aluminum
or iron. Can be fitted with bronze bushings in the
wrist pin holes same as in iron pistons. Dowmetal
has no permanent growth. The expansion is little
more than iron.

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AUTO PARTS

SAVES 50% TO 75% ON ALL CARS
New and Used Gears—Springs and Axles—Cylinders—
Motors—Rear Systems, etc. Wire or Write

INDIANA AUTO PARTS CO.
318-18 NO. ILLINOIS ST. INDIANAPOLIS, IND.
LARGEST CAR WRECKERS IN INDIANA

PARTS

MITCHELL, COLUMBIA, LIBERTY, STEPHENS and
PREMIER. Parts for all models. Discount to the trade.
Mitchell Co., 421 W. 35th St., New York.

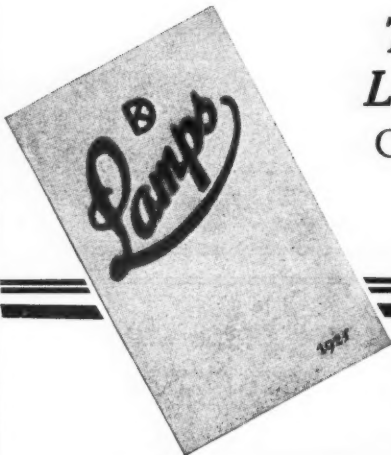
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MANUFACTURERS REPRESENTATIVE

WANTS 2 ADDITIONAL
LINES FOR ILLINOIS. 3
MEN COVERING TERRI-
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SORY DEALER AND CAR
DEALER. ARTHUR
O'LEARY, 1716 S. MICHIGAN
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Bigger and Better Than Ever
**The NEW 1925 LINE
 K-D AUTO LAMPS**

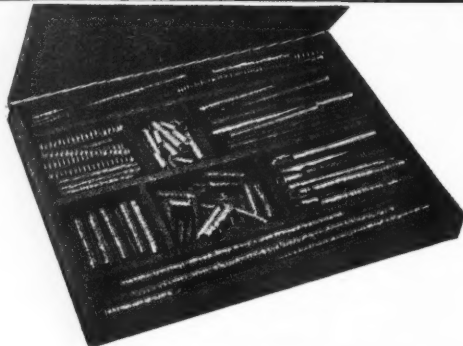
Write TODAY for your copy of the new K-D Catalog. It's your surest guide book to auto lamps that will increase sales, profits and customer-satisfaction.



**THE K-D
 LAMP CO.**
 Cincinnati, O.



Small outlay - Big Profits



\$3⁵⁰
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**PECK
 GARAGE
 ASSORTMENT**

Earn good money on spring replacements from this PECK Garage Assortment. The most needed sizes in generous quantities. A \$3.50 investment yielding big profits on replacement jobs. You'll like the strong partitioned box included with this set. Mention Jobber when ordering. The Peck Spring Co., Plainville, Conn.

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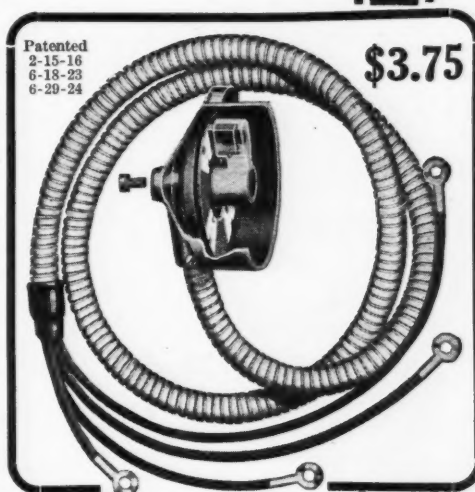
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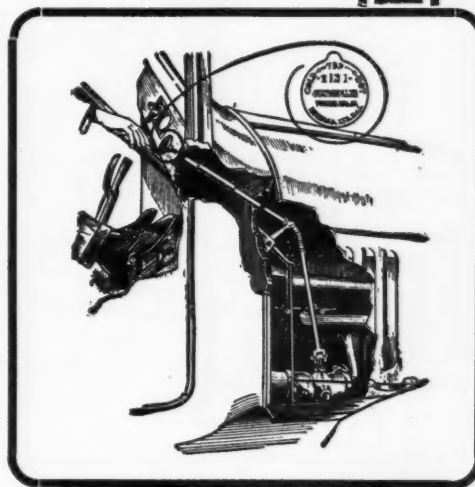
INSTANT STARTING

Much depends on a timer in winter and the Turner 2 in 1 Timer delivers! It gives an instant start in coldest weather. Contacts of exclusive design make and break full width of brush. Inserts of new insulating material between contacts, an exclusive Turner feature, stop all flash and pitting. Raised race gives even more protection against timer troubles. Remainder of disc is highest grade Bakelite. Strong aluminum shell excludes all foreign substances. Enclosed wiring assembly insures against "shorting." Strongly built throughout. Sliding-brush, self-wiping design that has proved best for year 'round service. Same low price—\$3.75.



Another Winter Seller

The Turner 2 in 1 CARBURETOR CONTROL gives adjustment and choke in same dash button, replacing regular Ford choke button. Does away with motor "killing" and frequent choking. Assures instant starting, regardless of temperature. Turn of the attractive button gives richer mixture for starting and a lift of the same button chokes motor. Leaner adjustment after motor is warm. No holes to drill. Can be put on in five minutes with screw-driver. Lists at \$1.25. Attractive demonstrator displays furnished to dealers.



Jobbers, dealers: Write for full information on the Turner line.

TURNER

2 in 1 TIMER

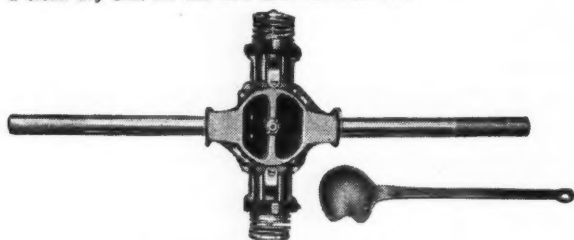
TURNER MFG. CO.
Dept. K, Kokomo, Indiana

Extra Profits for You!



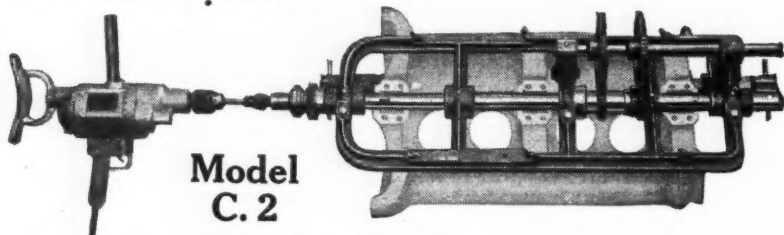
**Model
C. 17**

Combination Babbitt Furnace and Torch. Melts the Babbitt to proper temperature and holds it there. At the same time it melts out the old bearing. Leaves a clean dry seat for the new one. Economical.



Model H. 40

Molds Fordson Main Bearings. (Just like H. 4 for Fords) except special size. Casts flanges on end-thrust bearings. Shears off the core.



**Model
C. 2**

Bores all 3 Fordson Main Bearings in one operation. Just like C. 1 (for Fords) described opposite except built to fit Fordson Block. Equipped with gauge for setting cutting tools and for measuring the facing of end-thrust bearings. Also socket for electric drill. Both C. 1 and C. 2 are accurate to $\frac{1}{2}$ -1000th of an inch and center from cam-shaft openings.

Hempy-Cooper Tools Do Main Bearing Jobs Cheaper Than Ford Factory Charge

In 20 minutes, with Hempy-Cooper Rebabbiting Appliances, you can cast in all three Ford Main Bearings and bore them out in perfect alignment ready for the crankshaft. Your total cost for labor and materials runs only \$1.25 to \$1.50.

Model C. 17 Babbitt Furnace melts the babbitt ready for pouring while it removes the old bearings from the block. Finishes the job in 40 seconds. Model H. 4 (H. 40 for Fordsons) then babbitts in the bearings. Three minutes for this operation. Model C. 1 (C. 2 for Fordsons) then bores all 3 bearings in one operation, thus assuring perfect alignment. Five minutes for this operation. Adjustable to worn crankshafts.

Contrast this simple, speedy, efficient Hempy-Cooper way with the old-fashioned method of reconditioning bearings. The old way takes from 3 to 8 hours. Even then the changed position of the crankshaft caused by reconditioning often causes noisy timing gears and customer dissatisfaction. An expensive job in more ways than one!

This equipment demonstrated at all Ford Clinics throughout the country during the past year.

Ask Your Jobber

Hempy-Cooper Tools are sold by leading jobbers everywhere. Stop tightening and reconditioning bearings the old way. Do the job right—the Hempy-Cooper Way. Make friends of your repair customers. For full information on prices, etc., phone or write your jobber today or send for our Free Catalog.

Made by
Hempy-
Cooper
Mfg. Co.

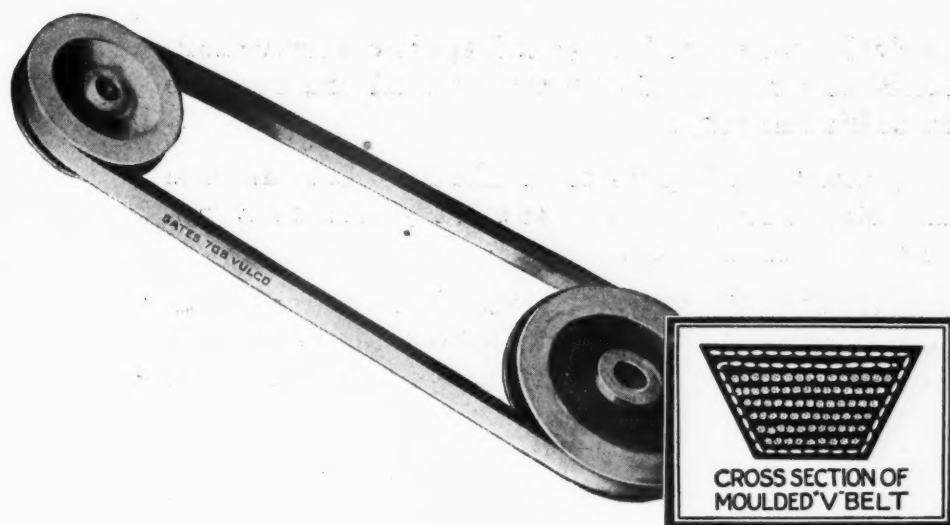
HEMPY-COOPER

Rebabbiting Appliances

412
Archibald
Ave.,
Kansas
City, Mo.

GATES BELTS

"The Standardized Fan Belt"



70 to 80 endless
cords running com-
pletely around each
belt—the same cords
and the same con-
struction as in a cord
tire—that's why the
Gates Vulco V-Belt
gives satisfaction.

Made by the World's Largest
Manufacturers of Fan Belts.

***An Automotive Salesroom Today
Without a Line of Good Trucks
Is Like a Grocery Store That
Does Not Carry Staple Goods***

The dealer who establishes a Republic connection, establishes a means of contact with all the business men of his territory.

The dealer with Republics on the floor has one line which stays in style as long as it is stylish for his customers to make money.

In the truck business, too, service is a standard commodity which needs no pussyfooting. Many a dealer for the first time gets his deserved profit out of the shop when he adds the Republic line.

No matter what you are now handling, your other line ought to have an institution behind it as sound as Republic. Why not find out what you could make out of such a good franchise for such good trucks? A line from you brings the answer.

REPUBLIC MOTOR TRUCK CO., INC., Alma, Michigan
More Trucks in Use than any other Exclusive Truck Builder



Yellow Chassis Trucks